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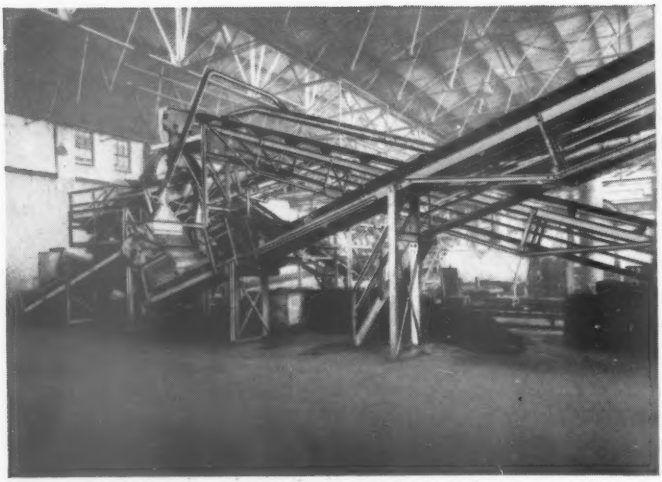

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Asking for More

Great developments have taken place in foundry practice since the end of the last war. In melting there have been marked advances in electric processes and in cupola practice. On the foundry floor, a minor revolution has taken place consequent upon the establishment of CO_2-hardening and shell-moulding practice. Similar progress has been made in coremaking, in heat-treatment, in fettling, in personal hygiene and working conditions. New casting alloys with outstanding properties are now in regular production, yet, whilst most of these innovations have resulted in a reduction of handling costs, this feature still remains the most important factor in founding.

Transport problems vary according to the nature of the work undertaken. The large jobbing foundries, which traditionally placed reliance on the overhead cranes and wheelbarrows, find that, with the CO_2 Process, there is a lowered demand on crane power and no fuel has to be handled for drying stoves. In many cases, too, in large numbers of foundries, wheelbarrows have been replaced by fork-lift trucks. Problems in transport are never entirely overcome, however, and the CO_2 once transported in bottles has now been changed to the cheapest form of conveying, that of piping. In the light repetition foundries which are fully mechanized, attention is being turned towards the automatic handling of moulds, box-parts and castings in between a progressive series of production processes. A typical example here is the application of mechanical contrivances for overcoming ferro-static pressure, instead of the cumbersome methods of hand-placing of weights on the moulds. Cast-up moulds are now made to quit the conveyor by either mechanical pushing or tilting a segment to deliver them to the knock-out. The electro-magnet has not yet been used at the knock-out for retrieving castings, but its application is possible.

Old notions, just because they are old, must not be left out of consideration. Only recently, a canal stretching between two works of the same organization has been refurbished and manned. The time taken to transfer the goods by canal from one factory to the other is not greatly in excess of that taken by lorry, whilst the cost is stated to be considerably less. The quantity, shape and frequency of movement of commodities are factors which it is necessary to study very carefully before a decision is taken to apply mechanical transport. A dump loader would seem to be an attractive proposition for handling the cupola drop, but as this happens only once daily, the cost would be excessive unless other work could be found for it. Maybe even this job, by a little ingenuity, could be carried out by a pallet and fork-lift truck. It remains true that, whilst much has been done already, there is still room for much more mechanical handling in our industry.

G

Investment Casters' Meeting

Ending to-day is the (American) Investment Casting Institute's annual fall meeting at the Sheraton Hotel in Chicago, which has been in progress since November 19. Included in the programme was a discussion of the advantages and disadvantages of induction melting and carbon-arc melting of high-alloy steels by L. J. DiNuzzo of the (US) General Electric Company's foundry department, and as a special feature, Dr. N. J. Grant, of Massachusetts Institute of Technology reviewed his recent trip and tour of Soviet steelworks in Russia and Siberia.

Reports by sub-committees of the Institute's Process Materials Committee included a demonstration of standardized test procedures for determining the physical properties of proprietary investments by T. E. Moore, manager of Ransom and Randolph Company's industrial division; a demonstration of test procedures on pattern materials by Paul Solomon, sales engineer of the Yates Dental Manufacturing Company, and a paper on low-melting-point plastics patterns by Dr. Charles J. Marsel, New York University.

CFA Supervisor and Instructor Courses

The Council of Ironfoundry Associations announces that two courses for ironfoundry supervisors will be held at Tor Lodge, near Wolverhampton, during the following periods: Course No. 9 from December 30, 1957 to January 3, 1958, and Course No. 10 from April 14 to 18, 1958.

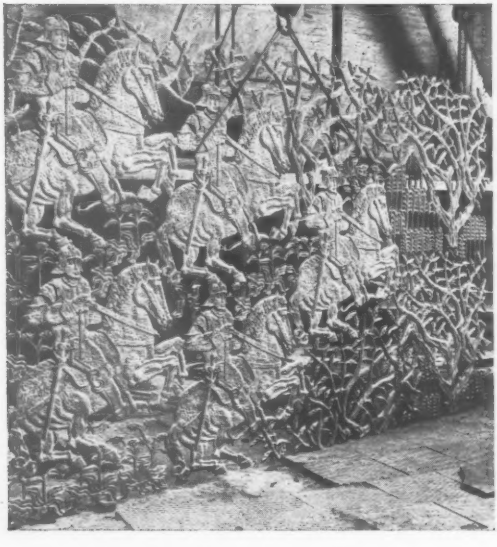
Courses for foundry instructors

Special arrangements have been made by the CFA with the Ministry of Labour for two courses, each lasting a fortnight, to be run at the Staff College for Instructors, Letchworth, Herts. These courses are for apprentice instructors, supervisors and senior men responsible for training apprentices and not more than 12 men can attend at a time. The programme, designed to teach the technique of instructing, will help to meet the need for better methods of training apprentices and other workers in the foundry. Details are available from Mr. John Collett, training officer CFA, 14, Pall Mall, London, W.1.

Art Casting in Aluminium-bronze

T. M. Birkett, Billington & Newton, Limited, of Hanley, Stoke-on-Trent, have recently completed for installation in the restaurant of Lewis's stores in Liverpool, screens depicting the Wars of the Roses. They are 14-ft. long by 8-ft. high and the two outer panels are identical, depicting knights on horseback, surrounded by trees, wheatfields and rose bushes. The centre panel (not shown) depicts peasants still working in the wheatfields whilst the battle is taking place around them. The foundry, of course, could not cast the whole in one piece because of the danger of "short running." Thus the sculptor, Mrs. Mitzi Cunliffe, decided that the best way to make these screens (which are only 1-in. thick at the most) was to have them cast in sections a maximum of 4-ft. square, and welded together. Again, repeating the sections, saved much of the pattern cost. Aluminium-bronze was chosen, first because of its rigidity, then for the attractive surface finish as-cast, and finally, because it could be welded perfectly. The normal architectural bronzes when welded do not possess the high strength of aluminium-bronze, and their colour is less attractive for this type of work.

Some of the decorative panels cast by T. M. Birkett, Billington & Newton, Limited, for the restaurant of Lewis's stores, Liverpool. In the right-hand illustration (a close-up of one of the sections) the sculptor, Mrs. Mitzi Cunliffe, is watching final touching-up operations at the works.



Enamelling of Aluminium*

By A. Biddulph

The development of enamelling from an art to an industry really commenced early in the 19th century with the invention of steelmaking by Bessemer, Siemens and others, and the subsequent demand for enamel coatings on steel sheet. In this fashion what had previously been used mainly as an adornment for precious metals became a utility surface for general use, especially in kitchen ware. The following article describes in particular the problems of enamelling aluminium.

By the beginning of the 20th century industrial enamelling included a wide range of domestic and commercial equipment in sheet steel as well as cast iron. As the advantages of the durable finish and wide colour range available with enamel became more generally appreciated the scope for utilization of an enamel surface continued to extend.

Early Limitations

More recently, a tremendously increased production of aluminium (called for to meet the wartime demands of the Services) became available for peacetime industry. It was utilized for old and for new purposes, and in some cases as an alternative to steel when that metal was only obtainable against "M" forms. Some of these purposes required a permanent decorative finish such as enamel provides, and some enamels in a limited range of colours were evolved but their use was also limited, partially by the narrow range of colours available and partly by the difficulties of application and by price. For dress jewellery and trinkets, aluminium had been used and enamels were available for its decoration, but these were in a price range which placed them outside the field of use for domestic equipment.

It may be asked why apply enamel to aluminium. There are several reasons for doing so, first of all for decoration, for providing a colour other than the natural colour of aluminium, pleasant though this may be, and second, for the prevention of corrosion, particularly for outdoor uses of aluminium as a building material.

It is often claimed that aluminium does not rust, which is certainly the case as rusting is specifically a description of an occurrence in relation to iron. Aluminium, like most metals, does oxidize in air and under some conditions of weathering will oxidize severely. In resisting such conditions enamelling has many advantages.

Basic Requirements

In elementary terms enamelling involves the application of a frit or glass suitably compounded, ground and suspended, to a suitably cleaned metal surface, followed by heating of the metal to cause the particles of frit to flow together and to produce a continuous glossy surface upon the metal. There are many properties required of such an enamel, in terms of colour, gloss, smoothness, hiding power, resistance to acids and alkalis, to thermal shock, to heat, to mechanical damage. All the foregoing are qualities present to a major or minor degree depending on the extent to which they are necessary for the particular purpose of the enamel. There are, however, two functions of an enamel which must be controlled rigidly; these are not normally mentioned, however, because they are so self-evident that an enamel that does not satisfy the conditions is not useable. The enamel must have a softening temperature below that of the metal to which it is to be applied, and should also have an expansion that is compatible with the metal.

Whilst enamelling of aluminium satisfies the elementary principles mentioned, there are many ways in which the detail of enamelling differs from enamelling of sheet steel, and it is these differences which will now be discussed.

Fusing Temperature

In the enamelling of sheet steel, enamels are used with a softening point or rather fusing temperature of between 750 and 900 deg. C., on a metal which has a melting point in the region of 1,500 deg. C., although becoming soft enough to become distorted in firing at 900 deg. C. The expansion of the enamels is somewhat lower than that of the steel. It is customarily expressed as a coefficient of cubic expansion per degree centigrade $\times 10^{-7}$, the figure for steel being around 400 and for enamel usually between 290 and 330, as measured in the range of 20 to 300 deg. C. In the case of aluminium the metal, as commercially used, and sometimes containing alloying elements, has melting points from 560 to 660 deg. C., and expansion of the order of 650 to 720. Thus to apply an enamel coating successfully to aluminium and its alloys an enamel is required with a fusing temperature below 560 deg. C., and an expansion much higher than any enamels used upon iron. In making such an enamel it is necessary to look beyond the orthodox range of frit materials, and also outside the usual price bracket.

Metal Preparations

A clean metal surface, in a state suitable for the application of the enamel is just as necessary as with steel, and with similar variation to meet differences of metal as received. Handling of aluminium requires care to avoid scratching which produces ridges of metal that may protrude through the thin enamel coat, causing blemishes, or larger particles may be embedded in the surface of the soft metal. Cleaning of the metal includes immersion in several solutions, which may vary according to

* Extract from a paper presented at the annual conference of the Institute of Vitreous Enamellers held last month in Chester.

Enamelling of Aluminium

the particle alloy of aluminium concerned. There are proprietary cleaners available, each with their special purposes.

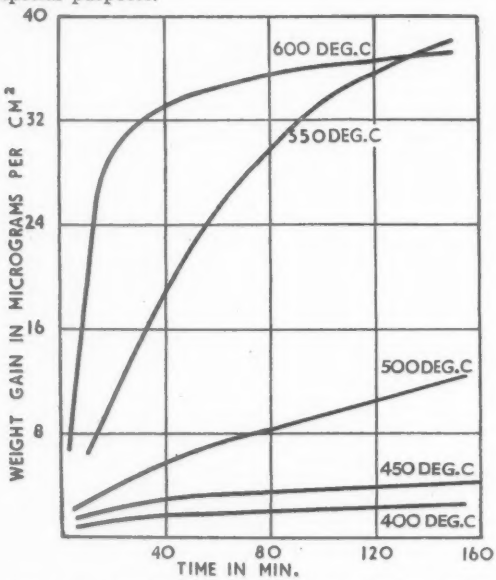


FIG. 1. — *Oxidation tests of metallographically polished specimens degassed at* 600 *deg. C.*

First the metal is degreased, usually by solvent degreaser, but this may require preliminary wiping if the items are very greasy.

A general-purpose cleaner bath is made up as follows:—

Sulphuric Acid	6.0 per cent.
Detergent	0.5 per cent.
Water	93.5 per cent.
Temperature	20 to 25 deg. C.
Time	15 to 20 minutes.

Several household detergents are suitable as additions to this bath. After rinsing the ware in water it is then placed in a chromate bath made up from:—

Chromic Sulphate	0.241
Potassium Dichromate	17.7
Sodium Hydroxide	9.5
Water	96
Temperature	49 deg. C.
Immersion time	2 to 5 minutes.

This is followed by rinsing in clean running water, and brushing to remove any loose deposit from the ware, which is then placed in warm air to dry off. Several of the low alloys of aluminium can be coated effectively without immersion in the chromate bath; SIC, NS3, NS4 are in this category.

Oxidizing

The aluminium components are next heated to a temperature within 20 deg. C. enamel fusing temperature, to promote the formation of a thin oxide film. The purpose of this film is to provide a passive oxide layer between the metal and the enamel and thus avoid excessive reaction between the alkaline slip and the metal base during the firing cycle. Omission of the pre-firing is sometimes possible under favourable conditions; otherwise such omission will result in blisters.

It is likely that the oxide film is a factor in promoting adherence of the enamel, but sufficient oxide to achieve adherence may be produced during the enamel firing cycle. In cases where metal has been enamelled without preheating, the adhesion has been good even though blistering may have been severe. It is not often that poor adhesion is encountered, although there are other difficulties to ensure interest.

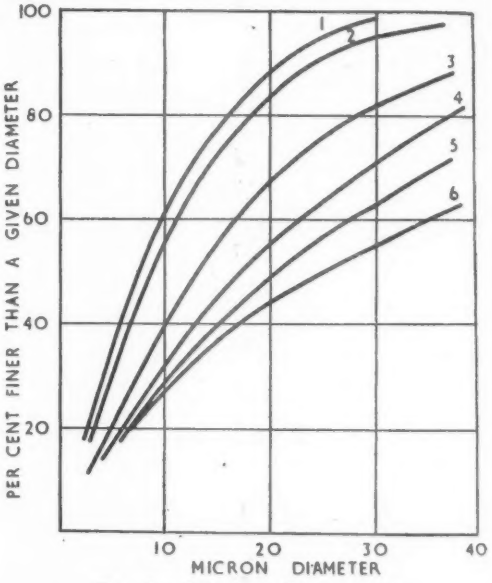


FIG. 2.—*Sub-sieve fineness tests.*

Key: 1. AL-4 Frit—0.022 gm. residue on 300 B.S. sieve from 50 c.c. sample—Suitably ground. 2. AL-4 Frit.—0.06 gm./300/50.—Suitably ground. 3. AL-4 Frit.—1.14 gm./300/50.—Coarse ground. 4. AL-4 Frit.—8.6 gm./300/50 and 2.28 gm./200/50—Very coarse. 5. Titanium White for Steel—1.4 gm./200/50.—Typical grinding. 6. Ground Coat for Steel—5.3 gm./200/50.—Rather finer than normal Ground Coat.

At the usual firing temperature of 540 to 560 deg. C. an oxide film is formed much more quickly than at 500 deg. C. and below. Tests made to determine oxide formation by increase in weight were found to give inconsistent data, and further work showed that release of gases during heating could be a cause of inconsistency. Some work performed by Smeltzer[1], who first degassed aluminum samples before oxidation, indicates the comparative rates of oxidation at different temperatures, as shown in Fig. 1.

Castings

The general cleaning procedure outlined earlier may be used for castings, with modification of

immersion times to secure thorough cleaning of the casting skin.

Blasting with a non-metallic abrasive followed by pre-firing has shown fairly good results, with some castings produced from sand moulds. Some difficulty has been experienced with pressure-die-castings. After cleaning and during preheating several instances have occurred where blisters have formed over the surface of the casting, blisters similar to laminations in sheet material. These may arise from expansion of gases trapped within the metal at the time of casting, and may be aggravated by the cleaning operation. Much work on this subject remains to be done.

Cleaning is followed by a heating cycle in which the metal is placed in a furnace and brought up to temperature near to or equalling the enamel fusing temperature. In certain instances it is possible to omit the preheating operation. It is sometimes found that metal that has been through the chromate bath will have a loosely adhering film after the preheating operation and this is removed by brushing over. The metal is then ready for the application of the enamel.

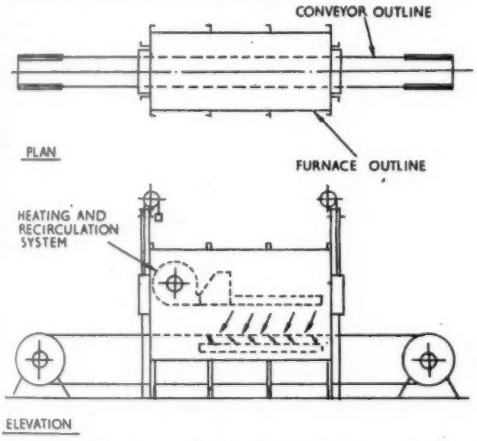


FIG. 3.—*Diagram of lay-down type continuous furnace.*

Milling of Enamels

Enamels for aluminium have been developed which have low working temperatures and in some cases this has been achieved by use of lead oxide as a substantial proportion with the enamel batch. Most aluminium frits have a higher specific gravity than the usual frits for sheet steel, and mill charges carry greater weights. A mill with a normal capacity of 50 lb. sheet-iron frit will take 70 to 80 lb. of aluminium enamel frit.

Aluminium enamels generally are ground to a smaller particle size than steel enamels, partly to secure the most rapid softening of the particles when fired and partly to help suspension and also to aid in the smoothness of the thin coatings applied. Routine checks are made with a 325-mesh sieve and a typical specification is 0.1 gm. residue on a 325-mesh from a 50 c.c. sample. In practice a sample may be a multiple of 50 c.c. to secure a residue big enough to be determined. The rapid test method of measuring the residue by volume would not be applicable to such small residue, which should always be dried and weighed. Subsieve fineness tests by the hydrometer method of several millings of enamel are shown in Fig. 2.

Mill-addition materials have been evolved to suit the particular conditions of enamel and metal. The common suspending material, ball clay at about 5 per cent. plus an electrolyte such as sodium nitrite or sodium aluminate could be used to give suspension, but clay is a refractory material and while this refractory addition to sheet-iron enamel produces a rise in firing temperature which is permissible, the increase in firing temperature of aluminium enamel is too great to be acceptable. Although the behaviour of frit particles in relation to the metal surface during heating requires the presence of materials to control crawling and promote wetting of the surface these must be assimilated into the enamel without detriment to the final surface.

Mill Additions

Mill-addition materials are required not only to give suspension to the slip but also to give a bond to the frit particles when the slip is dried and during the initial firing operation. The mill addition should be such as to promote wetting of the metal surface by the enamel and to provide resistance to cracking of the dried slip due to thermal shock when the ware is placed in a hot furnace. In any fusing operation exposed metal will tend to rise in temperature quicker than the biscuit enamel because of the higher conductivity of the metal, and also because it is a continuous body. In the case of aluminium which has a very good conductivity this phenomenom is very noticeable and would tend to exaggerate cracking of the biscuit. Thus the materials added at the mill must provide suspension, binding and wetting, preferably without raising the firing temperature of the slip.

Considerable experimentation has been necessary to secure a workable mill-addition, and one that has been popular is 3 per cent. boric acid and 3 per cent. metasilicate. Later it has been found that a reduction of these materials to 2½ per cent. of each plus half of one per cent. bentonite has shown improvement of suspension in some conditions, and this is a much more satisfactory addition for the slip which is to be used for spraying on flat-ware. In the case of intricate shapes with acute changes of plane and of varying thickness, there have been tendencies to tearing at such irregularities. At the present state of development the most satisfactory mill-addition has been found to be boric oxide, 3½ per cent., sodium hydroxide 2½ per cent. and a proprietory suspension agent, Silka, 6 per cent.

The usual standards of cleanliness in enamel preparation are necessary with aluminium enamel, but doubly so if aluminium enamels are prepared in the same place as steel enamels. Storage of aluminium enamels is preferably effected in

enamelled bins; galvanized and tinned containers may be used but may cause contamination. Enamel slips when stored will tend to settle just as steel enamel will, but possibly to a greater extent. Moreover they have a tendency to flocculate in lumps of the order of $\frac{1}{8}$ in. so it is desirable that enamel should be sieved through 80 mesh shortly before it is used.

Application

Unlike the orthodox enamelling of steel, aluminium-enamel finished coat can be applied direct to the prepared metal. Ground coats are not necessary. Application may be by spraying or dipping or flow coating, but spraying is preferable. A finely ground slip does not drain as well as a typical sheet-iron ground coat. For spraying, a fine fluid tip and air cap is used, considerably smaller than the usual enamel spray-gun and similar to a typical paint spray. Coatings are of the order of 12 gm. to 18 gm. wet weight per square foot and it is necessary that a wet spray shall be maintained. With suitable production-quantities automatic spraying can be utilized.

Slip viscosity is lower than steel ground coat. Specific gravity is between 1.95 and 2.05. Spray application is sometimes made on the face-side only but it is more common to apply the enamel on the back of the plate as well as the face to avoid warping. Although aluminium frits have considerably higher expansion than steel frits they are still well below the expansion of aluminium and tend to pull the surface unless they are applied on both sides. In production, spray booth reclaim could be used for the under side of plates.

One encouraging factor in aluminium enamelling as compared with steel enamelling is that missprays, bare patches, etc., can more readily be corrected. The aluminium is prefired to raise a passive oxide film and if there are any bare parts the extra oxidation during the firing of the aluminium is quite small and the exposed surface is still good as a base for enamelling, thus any bare parts can easily be coated, as can also any pinholes resulting from tears which have not healed up.

Drying

In many instances it is not necessary to dry off the water from the slip before the aluminium is fired, although production conditions may make it desirable that drying is carried out. If, however, production-quantities justify having automatic spraying and continuous furnace, the components can be introduced into the furnace while still wet, so long as there is sufficient ventilation to get rid of the water-vapour.

Often, it is desirable that certain parts shall be kept clear of enamel, a requirement which is met in the case of iron enamelling by brushing off the cover-coat. Aluminium enamels, however, do not respond freely to the brushing technique. The dried slip is hard and tenacious and a brush that would remove the biscuit enamel would probably also score the metal surface. Enamel could be kept off the metal by wiping while wet or by masking off with tape or with a latex solution such as "Copydex."

Fusing

Fusing temperatures at present in use for aluminium are of the order of 530 to 550 deg. C., and it is highly desirable that the selected temperature shall be maintained plus or minus 5 deg. C. Most furnaces that are built for 850 deg. C. would not be capable of providing such a controlled temperature at 550 deg. C. With electrically-heated furnaces it may be possible to adapt the furnace by means of baffles to secure a more even heat. This has been done in the author's own development work where baffles have been designed so that there is not only a baffle between the heat source and the items being treated but air convection currents are induced within the furnace.

If, however, a furnace is to be built for enamelling aluminium, recirculation of air is a convenient way of securing even heat-distribution, and several continuous furnaces have been built where this principle has been applied. A diagrammatic view of a lay-down continuous furnace is shown in Fig. 3.

In the actual firing of the aluminium adequate support is necessary, even more so than with steel sheet. Owing to the lower temperature, however, perrits can be made of very light material. Stainless-steel bars of 1-in. × $\frac{3}{32}$-in. sheet with points made from $\frac{1}{8}$-in. wire about 3-in. long are quite strong enough for the purpose, and give long life with minimum corrosion. That is for flat ware. In the case of castings and holloware, supports should be as used in the best practice for steel holloware. In the case of intricate shapes adequate jigging is required.

Composition

To the question of jigging must be added that of metal composition. The melting points of aluminium alloys vary between 550 and 660 deg. C., although the materials most likely to be encountered such as 99 per cent. aluminium, NS3, NS4 and H.9, have a high enough melting point to be safely fired at 560 deg. C. Some other alloys, however, have much lower melting points and can only be fired by taking every precaution in jigging and by firing at a rather lower temperature for a longer time.

DISCUSSION

MR. J. C. BAILEY (Aluminium Development Association) said that the paper took his mind back to the Spring Meeting held by the Institute at Torquay in 1950*, at which a paper on the vitreous enamelling of aluminium alloys had been discussed. He believed that that was the first occasion on which the subject had been discussed at a conference. It seemed that in 1950 there had been many formidable technical problems in vitreous enamelling to be solved: the composition of the frit had been uncertain and it had not been known which of the various possibilities to choose. With regard to possible applications, no one at that time

* JOURNAL, June 1, 1950, p. 591.

had thought of any use to which the product could be put, once it had been successfully made. To-day the outlook was very different, and Mr. Biddulph had shown the progress which had been made in the last seven years.

Industrial Significance

The aluminium industry, Mr. Bailey said, had tried to assess the situation but it was not easy to do this. The industry provided aluminium and contended that it was satisfactory without any surface coating at all, so how did vitreous enamelling fit into the picture, and where did it stand in relation to other finishes which could be applied to aluminium, such as anodizing, which also gave colour. It seemed to the aluminium industry that vitreous-enamelled aluminium must be thought of as a product rather than a process, and that its characteristics as such had to be studied. It was a mistake to compare it with vitreous-enamelled steel.

Again, it was looked upon by the aluminium industry as another finish for aluminium and it was assessed accordingly. On that basis, its distinguishing features were that it was a new and different finish for the material, and would attract attention if only because it was new, newness being quite sufficient in these days to bring any product into notice; and also that it provided the architect with another range of colours and textures. Second, it was very durable, being a combination of glass and aluminium, both of them extremely durable products. It had yet to be shown how durable it was, but the oldest erection in vitreous-enamelled aluminium was already nine years old, so that some long-term information was being built up in that way.

Third, it had the quality of being able to withstand a good deal of deformation, an important feature with regard to its durability. He did not know what would happen when small boys threw stones at vitreous enamelled aluminium, and there was not a great deal of guidance on that, but it seemed unlikely that severe corrosion would set in at the point of impact. This quality was also important in allowing the rectification of a vitreous-enamelled product which had lost shape in the furnace or for some other reason.

Casting Alloys

The particular casting alloys which were suitable for vitreous enamelling were among the more ductile and would themselves withstand a good deal of deformation, so that it should be possible to rectify, and indeed do a little shaping on, a vitreous-enamelled casting if the right alloys were chosen. Aluminium sometimes needed to have more rigidity than was normally available from the basic properties of the material, and perhaps the vitreous enamelling would help in that situation.

The vitreous enamelling of aluminium, moreover, was applicable, as the author had shown, to welded components, and there it had an advantage over anodizing, which, though applicable to some welded units, such as flash welds, was not readily applicable to argon-arc welds or gas welds. There was an important place for vitreous-enamelled aluminium because of that property.

Strength at Elevated Temperature

Would the Author say something about the strength of the product at elevated temperatures, such as 100-150-200 deg. C., which were temperatures at which aluminium alloys began to show signs of weakening. That might be important for certain applications? An attempt had been made to speculate, though it was difficult to do so, on what the fields of use for this product were going to be. So far, building seemed to be the main one, and that undoubtedly would be a major field; but, because of the property of resisting mechanical damage, and the possibility of rectification of the enamelled product, it might be found that nicely-coloured products with the smooth finish characteristic of vitreous enamel might prove useful for many domestic appliances, such as vacuum cleaners, and perhaps even for furniture of new design. There would be special uses due to electrical resistance, and the non-magnetic properties of the product, although it was to be doubted if these would represent an extensive application.

All that, of course, depended on the price of the product, a point which Mr. Biddulph had not mentioned. It would be helpful to everyone in thinking about this untried product if he could give some indication of how it stood in relation to other finishes with which it was likely to be to some extent in competition.

MR. GRIFFITHS, speaking as a vitreous enameller and an anodizer of aluminium, said that vitreous enamel had the great attribute of being permanent in its colour, whereas anodizing was suspect, though anodizing was being applied to such parts as window frames and the anodizing associations stated that certain dyestuffs were permanent.

Points of Detail

Mr. Biddulph had referred to the oxide film. Would he give an indication of the desirable thickness and say whether it could be applied by anodic oxidation, which could be controlled in tenths of a thousandth of an inch, from 0.0001 to 0.001 in. Also, what would happen to enamel which had been fired for a short time at a higher temperature than that stated in the paper. Mr. Griffiths asked this because he had fired it at a temperature indicated as 800 deg. C. He would also like to know if a dry enamel could be applied over an adhesive coating such as gum arabic, to provide another means of coating.

Other Potential Uses

MR. J. W. PEDDER said that so far as he could remember when the subject had been discussed at Torquay the question of oxide had not been raised at all. Perhaps there had been an improvement in the process, and that was now desirable. With regard to thickness, would Mr. Biddulph give an indication of the thickness used on ordinary sheets. Was it, he asked, desirable to put a coating on both sides of a casting, and with a hollow casting should the coating be put on the inside as well as the out-

Enamelling of Aluminium

side? Could the material be used for architectural purposes, and what were its acid-resisting properties? Had it been possible to get away from the use of lead, and was there a danger of contravening the Factories Acts by using an enamel which probably contained more than 0.5 per cent. of lead?

AUTHOR'S REPLIES

MR. BIDDULPH, in reply, said that Mr. Bailey's remarks had been in the main complementary to the paper. He could not give an answer on the question of the strength of the product, but there was no reason why an effort should not be made to find out how the strength was increased by the presence of the enamel coating. He thought that it would add to the strength of the material, particularly at temperatures high enough to reduce the aluminium strength but lower than the softening point of the enamel.

On the question of the price of the product he did not know enough about production costs to be specific, but if one sent to the jobbing enameller a piece of steel to enamel and wanted it in white it would cost about 2s. per sq. ft., and he thought the cost would be 3s. to 4s. if it was aluminium. The frit was expensive. With improved working conditions it might be possible to reduce the cost of some of the operations.

Time : temperature Ratios for Firing

Replying to Mr. Griffiths, he said he had no information about the thickness of oxidation. He knew, however, that anodic coatings were not beneficial to enamel; when given samples to be coated, if they had been anodized it was necessary to strip the anodizing off before they could be enamelled. Firing could be done for a short time at a high temperature. He had brought with him three plates, all with the same enamel but fired under different time and temperature conditions. They had used anything from 500 to 580 deg. C. At 500 deg. C. it took too long, and 580 deg. C. was on the high side; they had melted the aluminium before now in some of their experiments. The temperature, therefore, should be kept down to not more than 560 deg. C., and in production conditions it was better to keep below the melting-point of the metal.

Mr. Pedder had asked about the thickness of the enamel. On sheets of the order of 20, 18 and 16 gauge one coat would be about 0.003 in., and two coats about 0.006-0.007 in. He would not bother about doing the back side of a casting; a casting was usually rigid and the pull of the enamel would not affect it.

Acid Resistance

With regard to acid resistance, most of the enamels which he had used had an acid resistance of the order of A or A—. They had not absolutely perfect acid resistance and there would be a slight shadow with citric acid. Sulphuric acid, although it was no part of the test, had also been used. The acid resistance was of an order which would give good weathering. Some of the enamels were lead-bearing and some were leadless. Most of the colours could be obtained in lead-free enamel. The opacity was not such as to give a good type of white, but most colours could be obtained readily in leadless enamel.

Replying to Mr. S. E. A. Ryder, who asked if an organic suspension agent had been tried, Mr. Biddulph said that one organic suspension agent had been tried and the results had been disastrous, but another was to be tried within the next few days.

REFERENCE

[1] Smeltzer, W. W. "Oxidation of Aluminium in the Temperature Range 400 to 600 deg. C.," *J. Electrochem. Soc.*, **103** (4), 1956, April.

Foundry Equipment for Tunisia

A call for tenders has been issued by the Export Services Branch of the Board of Trade, Lacon House, Theobalds Road, London, W.C.1, on behalf of Societe Nationale des Chemins de Fer Tunisiens who are contemplating erecting a small foundry/steelworks permitting a monthly output of from 60 to 70 tons of steel and 20 to 30 tons of cast iron, in the old foundry building used for other purposes for some years in their works at Sidi-Fath-Allah, not far from Tunis. The plant required includes: Cupola furnaces (with skip, spark-arrestor and electric blowers); converter (with compressor, trunking, etc.); shot-blast equipment; sand-preparing plant; coresand mixer; core-drying stove; gyratory sieve; moulding machines, and a pug mill.

Tenders should be submitted in French, together with literature, prices and delivery dates to the Societe Nationale des Chemins de Fer Tunisiens, 67, rue du Portugal, Tunis. There is no time limit but naturally tenders should be submitted as soon as possible. A copy of the original notification (in French), together with a plan of the existing foundry building, is available on loan to UK firms in order of receipt of applications. Readers should quote reference number ESB 26136/57 in any correspondence with the Board of Trade.

Venting of Fires

Last week at the Building Exhibition in Olympia, London, Colt Ventilation, Limited, held a symposium on "Fire Control in Industry." Mr. H. M. Smith, C.B.E., Her Majesty's Chief Inspector of Fire Services, was in the chair and a talk was given by Mr. M. J. Reaney, director and general manager of the company, who compared British methods of fire-fighting with current American practice. It appears that nowadays there is a school of thought—which is gaining adherents—that the old method of shutting up a fire with the idea of stifling it is outdated and the new method is to provide roof outlets for smoke, flame and fumes, at least for single-storey buildings. In this way, a fire in such a building may be prevented from spreading and firemen can get close enough to bring appliances to bear. A film was also shown of an artificial fire staged to prove these contentions and to demonstrate the effectiveness of the firm's fusible-link-operated roof ventilators* for providing the outlet in case of fire—in addition to daily duty as weatherproof adjustable inlets or outlets for air.

* Described in this JOURNAL, October 24, 1957, page 501.

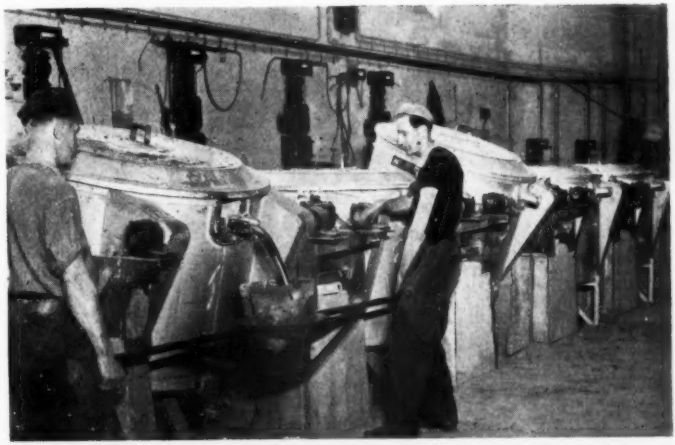
A Swedish Non-ferrous Foundry

Brief Survey of Equipment and Methods in use at Bröderna Söderberg

During the series of works inspections which formed so valuable a part of the International Foundry Congress held last August in Sweden, Bröderna Söderberg Metallgjuteri-Metallfabrik acted as hosts to two sizeable parties of visiting foundrymen. It was both pleasing and remarkable to founders from this country who were among the visitors to see such large reliance there on materials and plant supplied from this country. Not less remarkable was the excellent quality of workmanship in the castings being turned out, and, indeed, the evidence of versatility of method exhibited on all sides. There was none who on leaving could not claim to have picked up useful information to add to his knowledge of the "tricks of the trade" and none without appreciation of the generous hospitality and freedom of question and answer which were features of the visit.

Bröderna Söderberg Metallgjuteri at Eskilstuna, about 50 miles from Stockholm, was established in 1905 for the manufacture of non-ferrous castings and is to-day one of Sweden's leading foundries with modern equipment which fully meets the present-day demand for reliable high-quality products.

The number of employees is about 240, and the foundry produces castings in a large number of different non-ferrous alloys with a wide range of physical properties, such as high resistance to corrosion, wear, etc. Straight brass, red brass, tin bronze, leaded bronze, aluminium - bronze, manganese-bronze, and beryllium bronze are the principal copper alloys. Alloys LM 6, LM 2, Ceralumin, LM 4, LM 5, LM 10 and the firm's patented alloys BSM Al 5/10, Al 5/11, Al 5/12, Al 5/13 (with ultimate tensile strengths up to 22 tons per sq. in. in sand and 28 tons per sq. in. when chill cast) comprise the



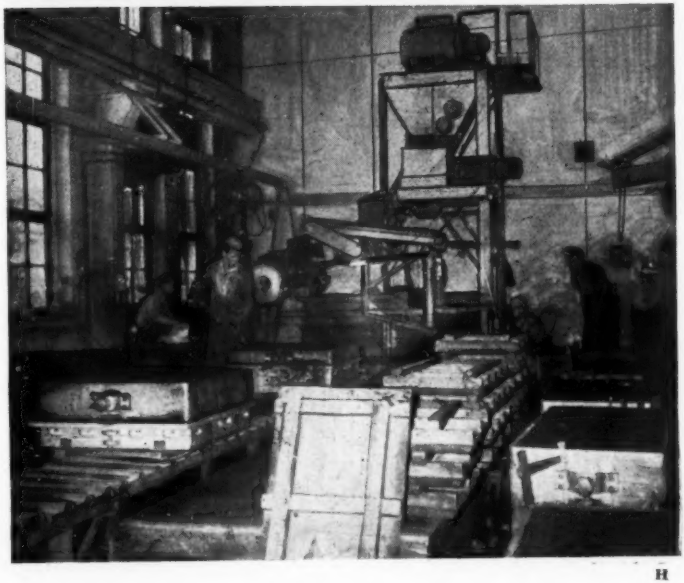


FIG. 1 (*upper*).—*Nine 350-lb. electric-resistance melting furnaces at Bröderna Söderberg foundry; note the hand control for power tipping (lip axis). Temperature indicators and switchgear are arranged behind each furnace.*

FIG. 2.—*Sand rammer used in conjunction with a rollover device for producing medium-size moulds for aluminium castings. Note the delivery of moulds on roller conveyors.*

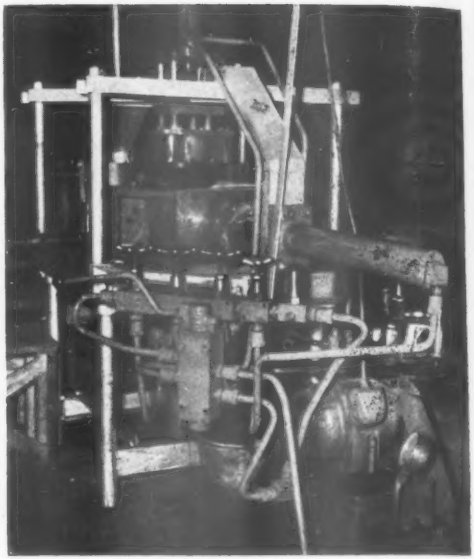


FIG. 3 (*top, left*).—*Band conveyor with a roller-conveyor extension leading to a vertical continuous core-stove.*

FIG. 4 (*left*).—*Withdrawing dried sand for core-making from hoppers fitted with sand-seal delivery gates.*

FIG. 5.—*One of the larger hydraulically-operated die-casting machines of domestic manufacture. The easy access to control valves is a noteworthy feature.*

main range of light metals produced. The annual production is about 1,000 tons of finished castings, with a maximum individual weight of up to 30 cwt. in copper alloys and 18 cwt. in aluminium.

Melting Shop

High-grade aluminium alloys are melted in nine electric-resistance furnaces (Fig. 1) with automatic temperature-control devices. Each furnace takes a 350-lb. charge which after melting is checked for gas content in a vacuum device. Other aluminium alloys are melted in oil-fired crucible furnaces and all copper alloys are melted in oil-fired crucible furnaces.

FIG. 6.—*Heat-treatment department at Bröderna Söderberg Metallgjuteri; a few typical castings, including a complicated vee-cylinder block, are shown on the right-hand side.*

FIG. 7 (*above*).—*X-ray examination of castings; in some cases, 100 per cent. checks are instituted for important components. The illustration shows the use made of a viewing screen.*

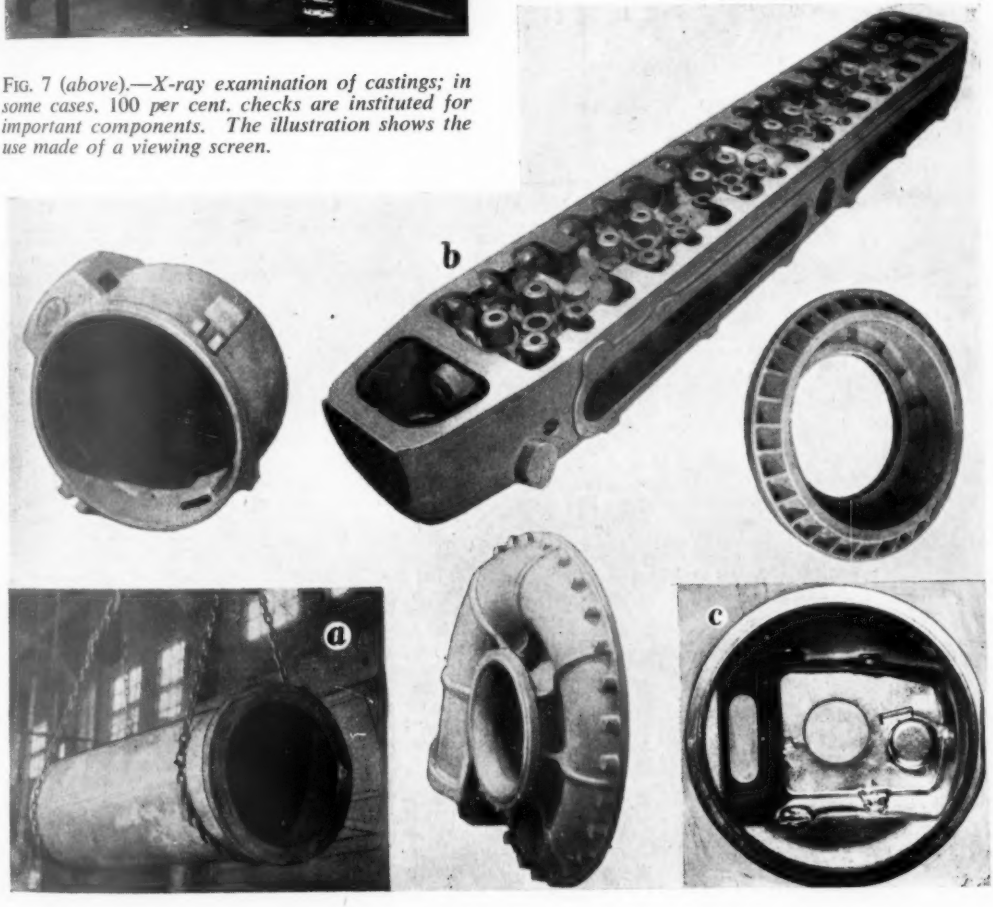
Moulding

The larger types of components in copper alloys are cast in dry-sand or cement-sand. Medium-size castings in aluminium alloys are moulded with a sand rammer in combination with a rollover machine for pattern withdrawal (Fig. 2). Smaller items are moulded in plain-squeeze, or jolt/squeeze/turnover machines.

Coreshop

Cores are produced by hand and by coreblowers, located on either side of a conveyor belt which carries the "green" cores to an oil-fired vertical stove (Fig. 3). Larger cores are dried in electric ovens. For making the cores, screened and dried

FIG. 8 (*below*).—(*a*) *Bearing casting in leaded bronze, net weight* 18 *cwt.;* (*b*) *complicated cylinder-head cast in LM* 8 *alloy and weighing* 100 *lb.;* (*c*) *one of the larger types of gravity-die-castings produced in LM* 6 *alloy; it weighs* 25 *lb. Also shown are three other typical aluminium-alloy castings.*



Swedish Non-ferrous Foundry

raw sand is delivered direct by wagon to the core-shop, where it is tipped into hoppers and flows through specially-constructed sand seals direct into convenient bins (Fig. 4) for transfer to the mixers.

Patternshop

A feature of the practice at Bröderna which much interested the visitors is the fact that all patterns are fully checked each time they are put into production and that pouring gates and areas of the runners, etc., are standardized according to a special system developed by Friedrich Nielsen* and patented in several countries (including British Patent No. 690, 790, April 1953). The sizes of runners and pouring gate are calculated for each assembly so that an even distribution of metal with the least possible amount of turbulence is obtained.

In the section of the foundries devoted to gravity-die-casting, aluminium alloys, principally, are cast but smaller quantities of aluminium-bronze, special brasses and zinc alloys are also produced from dies. There are two electric-resistance furnaces for preparing high-strength casting alloys. In addition, there is a number of oil-fired crucible furnaces of the pit type. The dies are made in the firm's own workshops, where quite complicated gravity-die-casting machines for manual or hydraulic operation are also produced (Fig. 5).

Heat-treatment and Control

The heat treatment of aluminium-alloy castings is carried out in electric furnaces embodying automatic direct-recording temperature control, shown in Fig. 6. All aluminium alloys are analysed by means of a spectograph. Impurities in copper alloys are ascertained spectrographically, though the main constituents of the alloy are checked by chemical analysis. All raw materials are analysed as received, moulding sand is checked every hour with regard to moisture content, permeability and resistance to compression. In the sand-testing laboratory, also, tests are carried out to develop new mixtures for both moulding and core sands. Radiographic inspection is performed—both by direct scanning on a screen and photographically—on all special components and as required for other castings (Fig. 7). Castings requiring to be pressure-tight are tested pneumatically or hydraulically. Other inspection routines include: Strength tests on cast specimens, hardness tests and, on special castings, crack-detection methods are applied on a production basis, as well as to prototypes. Fig. 8 shows typical castings produced in these shops.

* Described in the FOUNDRY TRADE JOURNAL, December 30, 1954, p. 769.

Methods Training Council

Seven members comprise the management council of a new company, limited by guarantee, which has been registered under the name of Organization & Methods Training Council. The company's object is to conduct an investigation into the basic training required for those in industry and commerce who carry out objective and analytical studies to increase effectiveness in organization and administration; and to run pilot training courses for such people, etc.

The first members of the council are:—Lord Courtown, head of office administration, Imperial Chemical Industries, Limited; Mr. Oliver J. Linforth, manager of the organization and methods department, Shell-Mex & B.P., Limited; Mr. John Ryan, vice-chairman of the Metal Box Company, Limited; Mr. John H. Spooner, cost accountant with the United Steel Companies, Limited; Mr. Reginald E. Turnbull, systems and audit manager of the Dunlop Rubber group; Mr. John E. Wall, senior manager of Unilever, Limited, and Mr. Neil C. Pollock, manager of the organization and methods department of Stewarts and Lloyds, Limited.

Caterpillar Tractor's Five-year Plan

A five-year plan of modernization and development by the Caterpillar Tractor Company, Limited, will completely change the face of the old Birtley works, Birtley (Co. Durham). Just over a year ago the company acquired the physical assets of the Birtley Company, which for over nine years had been manufacturing under licence earthmoving equipment to Caterpillar specifications.

Increased output of Caterpillar bulldozers and scrapers has necessitated the complete modernization of the site.

Col. R. T. Edwards, formerly managing director of the Birtley Company, is now director and manager of operations at Caterpillar's Newcastle plant.

Wild-Barfield Equipment for Russia

Wild-Barfield Electric Furnaces, Limited, are now building a 40 kw. high-frequency induction-heating generator for delivery to Russia. This unit, which has been ordered by Machinoimport, Moscow, is a standard generator incorporating the firm's well-known features of full range output power control and unit-built sub-assemblies. It occupies a floor space of only 51 in. by 58½ in. The order also covers a high-temperature furnace—model HTP 5. This is one of a range of standard units the normal operating temperatures of which range from 1,100 to 1,350 deg. C. The heating elements are of the non-metallic variety, the chamber length is 24 in., with a restricted vestibule and door opening 12 by 10 in. The equipment has its own built-in atmosphere-control system.

Staveley Changes

In his report to the shareholders of the Staveley Coal and Iron Company, Limited, Mr. T. A. McKenna, who is to retire next February, and is to be president of the company thereafter, announced that Dr. J. E. Hurst, C.B.E., J.P., is to retire, on medical advice, his full-time employment on December 2. Dr. Hurst has been managing director of Bradley & Foster, Limited, and its three associated companies, Bradley's (Darlaston) Limited; Bradley's (Concrete), Limited, and Arblaster & Company, Limited, since 1949. He is, however, to remain a director of the parent company and certain of its subsidiary companies and will also act in a consultative capacity to the four companies of which he has been managing director. Dr. Hurst will be succeeded at Bradley & Foster, Limited, and its associated companies by Mr. G. E. Lunt, as managing director, with Mr. J. L. Allen, J.P., as deputy managing director.

Notes from the Branches

South Africa

The South African branch of the Institute of British Foundrymen held a discussion evening on October 24 in Johannesburg, the subject being "Is Laboratory Control of Sands Essential?" The president, Mr. S. Pienaar, was in the chair.

MR. N. CROFT, who opened the discussion, said he thought the question posed could be answered in several ways—there was scientific control and actual control. As far as scientific control was concerned, sand control started with the fundamentals of sand testing. All foundrymen were familiar with such problems as green strength, moisture, etc., and most foundries carried out appropriate tests. The real point was whether the results of these tests were put to practical use.

MR. R. T. ROUNCE, who was in some doubt as to what was meant by laboratory control of sands, pointed out that a sand laboratory, no matter how well equipped with apparatus, could not possibly control moulding sands in a foundry because that was not its function. Its function was to provide accurate figures of the true properties of (*a*) the materials that went into the preparation of moulding and core sands and (*b*) the prepared sands themselves. He asked how could the laboratory control the properties of a system sand in a mechanized moulding plant? He went on to say that any samples taken on a system sand, when analysed, would show certain properties, but by the time those properties were known, that very same sand would have been rammed into moulds and probably cast. In other words what was the good of knowing that sand at 10 a.m. had 4 per cent. moisture when at 10.10 a.m. a batch of hot sand had started to flow through the plant and, unless the water input was adjusted, the sand would be too dry in use. On the face of things it seemed rather pointless, but he felt sure that without the supply of figures from the sand-testing department, it would be difficult to keep matters straight on the system plant. Obviously, it was up to the foundryman to adjust his water input, bentonite and coal-dust supply, screening and aerating mechanisms, and, with one eye on the figures supplied by the laboratory, endeavour to acquire such a balance that he could, in time, produce a uniform product—in other words he would be in real control of the sand. The control of foundry sand was obviously not an end in itself, but a means towards an end, the end being good castings. Sand results from the laboratory would not ensure anything; the information contained therein must be used in conjunction with observations of present practice and future experiments by the foundryman. Slavish following of academic requirements and figures would lead nowhere.

Synthetic Sands

A MEMBER said that during the war synthetic sands were introduced into South Africa. As progress had been made in the use of these, one thing had emerged and that was that, whereas in olden times much store was placed on information handed down from generation to generation—science worked on fact. Consequently, many of the pitfalls inherent in moulding had been overcome.

MR. PEERS, in reply to a question about the testing of sand on delivery at the foundry, said it was usually taken for granted that the sand asked for was in fact supplied. He agreed that the laboratory should extend its activities to cover raw materials and that there should be some sort of check on the sands received. Synthetic sands, however, were fairly closely controlled by manufacturers to-day.

In reply to a question concerning the comparison of sand control methods in South Africa with those of the United Kingdom, Mr. Croft said he had recently returned from the UK, and the difference was that there the foundryman had at his disposal a research laboratory on which he could call for technical aid at any time: in South Africa the foundryman had to work on his own. Efforts were being made to establish a foundry research committee in South Africa, and he felt that all possible support should be given to this project so that South African foundrymen would also be in a position to pick up a telephone and obtain any information they required. The big difference was that in overseas foundries the technical side was more developed and there was a reserve of knowledge available for calling on in an emergency.

Mr. Pienaar then proposed a vote of thanks and said it seemed evident that members agreed that laboratory control of sands was essential, but it had to be applied intelligently.

Sheffield & District

At a meeting of the Sheffield and district branch, held on November 4, the retiring president, Mr. J. F. Stanier, handed over his badge of office to Mr. G. L. Hancock, a director of David Brown & Sons (Huddersfield), Limited, the president for 1957/58. For the first time, the collarette carried inscribed bars bearing the names of past-presidents, from the date when the branch first acquired a president's badge. Mr. Stanier said that the cost of providing these inscribed bars had been borne by Mr. M. M. Hallett (himself a past-president), who wished before he left the city to leave a token of the esteem in which he held the Sheffield branch. (Mr. Hallett is now managing director of Chamberlin & Hill, Limited, Walsall and Lichfield.)

Mr. Hancock, in presenting his presidential address, brought out the necessity of the application of technical developments in meeting competitions from abroad, and drew on his experience during visits to Canada and the United States.

The address was followed by a lecture on "Pattern-making," by Mr. B. Levy (of B. Levy & Company (Patterns), Limited), and a lively discussion ensued. This brought out the points that a pattern can never be too good and invariably one gets what one pays for.

Tees-side

The structure of taxation on metallurgical plant and mechanical equipment in foundries was having a damping effect on the British foundry industry's most enthusiastic efforts, said Mr. John Blakiston, national president of the Institute of British Foundrymen, at the annual social evening of the Institute's Tees-side branch, held recently at Teesdale Hall, Thornaby-on-Tees. In addition, legislation, though probably justifiable, was demanding a high capital expenditure which was again handicapping British foundries in world competition. While every possible step must be taken to meet this competition, it was hoped the system of taxation would some day enable the industry to take more effective steps to meet it by installation of more competitive methods, already preconceived, but requiring satisfactory financial conditions for implementation. A native of Tees-side himself, Mr. Blakiston spoke of the pioneers of industry who came from the area—Israel Walker, Gjer, Lothian Bell, Noel Ridsdale and Dr. Stead.

New Patents

(Copies of complete specifications are obtainable from the Patent Office, Sales Branch, 25, Southampton Buildings, Chancery Lane, London, W.C.2, price 3s. 6d.)

781,328. Foundry Services, Limited, Long Acre, Nechells, Birmingham, 7.

Production of cores, moulds, and other shaped articles of bonded granular materials where hardening or curing of the binder is effected by the use of gaseous materials. In particular, but not exclusively, the patent refers to the manufacture of articles bonded with sodium-silicate-base binders hardened by the application of carbon dioxide.

781,490. Fritz Hodler, 28 Avenue de Collonge, Territet, Vaud, Switzerland.

Improvements in or relating to machines for casting under pressure. The inventor refers to a method of damping kinetic shock components which are set up in hot- and cold-chamber pressure-die-casting machines.

781,625. Erwin Buhrer, 117 Alpenstrasse, Schaffhausen, Switzerland.

Apparatus for facilitating the preparation of moulds, from a number of patternplates within the confines of a single moulding flask, regardless of the materials of which the patternplates are fabricated.

781,657. Industrie-Companie Kleinewefers, Konstruktions-und Handelsgesellschaft, m.b.H., Melanehthoustrasse, 5, Krefeld, Germany.

Cast-metal heat-exchange tubes for heat exchangers.

781,935. T. Harwood, 45, Leopold Avenue, Handsworth Wood, Birmingham, 20.

Metallurgical rotary furnaces for both ferrous and non-ferrous metals. The invention also relates to the blowing process, and has for its objective the elimination of guess work; this is an exact and pre-determined method.

782,172. J. I. Morley, 175, Hemsworth Road, Norton, Sheffield, 8; Charles Sykes, Atlas and Norfolk Works, Sheffield, 1, and Robert M. N. Gray, 10, Whirlow Park Road, Sheffield, 1.

Martensitic stainless steels with improved resistance to intercrystalline and transcrystalline stress-corrosion cracking.

782,192. British Oxygen Company, Limited, Bridgewater House, Cleveland Row, St. James's, London, S.W.1.

The treatment of molten iron and the refining of crude iron from the melting or blast furnace for the production of steel.

782,203. Allied Ironfounders, Limited, 28, Brook Street, London, W.1.

Sealing strips for effecting a watertight joint around the edges of baths, basins, etc.

782,205. Foundry Services, Limited, Long Acre, Nechells, Birmingham, 7.

Formation of hollow sand-cores. A mixture of sand and a gas-hardenable waterglass binder is blown into a core-defining cavity formed between a core-pattern and an insert. A gas, such as carbon dioxide, is then applied to harden the binder, thus causing the core to set.

782,248. Karl Schmidt Gesellschaft m.b.H., 10 Fabrikstrasse, Neckarsulm, Wurttemberg, Germany.

Light-metal pistons for internal-combustion engines. It provides a piston which can be cast with a triple core suitable for automatic or semi-automatic casting machines. In this the bottom part of the skin is so constructed that a body is formed which is still as rigid as possible in resisting deformation.

Law Cases

Metal Sling Accident

Stating that he was not convinced as to how the accident happened, Judge R. H. Norris at Dudley County Court gave judgment for defendants in an action brought by a labourer, Mr. Bert Gray, who claimed damages, agreed at £200 for an injury which had caused permanent stiffness of his right big toe.

The claim was against Grazebrook Foundry, Limited, Pear Tree Lane, Dudley, and it was alleged that the injury was caused by the negligence of one of their employees. It was stated that Gray was employed by Metallisation, Limited, Pear Tree Lane, on September 10, 1956, when he was sent across the road to Grazebrook's to borrow a mobile crane. Having got permission he asked the crane driver to move the crane, but before doing so, it was necessary to load a metal sling weighing 1¼ cwt. on to the 3-ft. high platform of the crane.

Gray said in evidence that he lifted the ring of the sling and part of the chain on to the platform and that when the driver went to throw the rest of the sling on to the platform, the ring was pulled off and fell on to his (Gray's) foot. Mr. E. Chater, the crane driver, said the ring fell off the platform after Gray had stopped holding it there to bend down to pick up one of the hooks. When he let go, the weight of the hanging chain caused the ring to slip off the platform. Judge Norris said he could not say that Gray's version was any more reliable than the story told by Chater.

Damages—Nil

Although a Glasgow steelworker won his action for damages against his former employees, in the Edinburgh Court of Session, the jury, sitting with Lord Strachan, assessed damages at nil. The plaintiff was Mr. John Docherty, and he sued the Springboig Steel Company, Limited, Glasgow, for £4,000.

Mr. Docherty said that on April 3, 1953, he was using a pneumatic chisel for dressing castings at the mill when the chisel broke. As a result he suffered from paralysis of his right hand. The accident, he claimed, was caused by the fault and negligence of the firm. It should have supplied chisels which would not break under ordinary use. The firm replied that it had carried out all the required duties. Mr. Docherty's account of his loss and injury was grossly exaggerated, and the company believed he was fit for work two months after the accident.

In the witness-box Mr. Docherty said he had not worked since the accident, but he was presented with evidence by Mr. J. H. Shearer, QC, for the company, that he had driven vehicles on several occasions when he claimed he was unfit for work.

THREE large diesel-electric generating sets for a power station in French Guinea, which is to be built by an international group of aluminium companies at Fria, are to be supplied by the Brush Group, Limited.

Ironfounders' Discussions in London

Annual General Meetings of JIC and BCIRA

There were two important meetings in London early this month, the one connected with the research and the other with the employers' side of the ironfounding industry. The first was the annual general meeting of the British Cast Iron Research Association and the second that of the Joint Iron Council; both were held on November 5 at the Connaught Rooms, London. In what follows brief resumés are given of the proceedings. It should be borne in mind that the JIC, as representative of the grouped ironfounders' employer associations, is responsible for much of the financing of research, through the BCIRA.

Joint Iron Council

The annual convention of the Joint Iron Council was held in the Connaught Rooms, Great Queen Street, London, W.C.2, on Tuesday, November 5, under the chairmanship of Mr. N. P. Newman, J.P., president of the JIC and chairman of the Council of Ironfoundry Associations.

The PRESIDENT said the meeting had one main purpose, which was to consider the annual report of the executive committee of the JIC for the year 1956-57. On this occasion the report covered the activities of both the JIC and the CFA, thereby avoiding duplication. MR. KENNETH MARSHALL (director, JIC) said the report not only gave a summary of the work of the JIC and its constituent bodies throughout the year under review, but also touched briefly on the major problems with which the industry had been concerned over that period. The first paragraph of the report referred to the major problem with which the industry and the country as a whole had been concerned over the last year. The industry had to be seen against the broad background of the failure—he did not say the Government's failure—to control the continued upward movement of costs.

It might be thought that certain steps which the Government were taking now would have been more easily taken, apart from politics, at an earlier date. He thought it was fair to say that the JIC and CFA had been very much alive to this problem. The industry had been faced with continual increases of costs, magnified and exaggerated by its very great dependence on coal in particular, a product which had suffered the greatest cost increases. The rise in the cost of coal was felt at several successive stages, first at the blast-furnaces and in the cost of moving materials to them, and again at the iron-foundries, in the cost of pig-iron, of its transport and of its remelting. So that the iron industry, of all the industries in Britain, had been the most affected by the continuous rise in coal prices.

That, and the rise in costs due to increased wages generally, had resulted in the steps taken by the Government during the last few months to curtail demand. The industry was particularly sensitive in this direction, because by its very nature it was dependent on capital investment. He believed there was no room for either the pessimist or the optimist, using those words in their usual sense. But in his opinion, fundamentally the future of the industry was by no means in jeopardy. He was not, however, particularly optimistic about the immediate future; he felt it must be accepted that the industry might have to go through a very difficult time.

Iron Production

Speaking of the JIC and its constituent bodies, he said that the present position was extremely difficult for all concerned, and particularly so for some of the producers of iron, who had suffered stringent revision of their plans because of the falling demand for foundry iron. The JIC had a very great interest in the security of future supplies, and he did not think that anyone present, particularly on the ironfounding side, would wish not to be associated with expressions of sympathy for their friends on the iron-producing side in their present difficulties. A blast-furnace was a very large piece of machinery producing a great deal of iron and could not easily be manipulated to meet changes in demand. It was a tribute to the co-operation given in the work of the Council that such matters could be considered round the table and that the future of the industry was taken into account.

Coming to the second section of the report, headed "State of Trade in the Industry," Mr. Marshall said it was mostly historical and the members were fairly familiar with the situation. But the executive committee had chosen to show picturesquely or diagrammatically in the report the progress made during the year. It would be seen that some sections of the industry had fared better than others; the figures shown were not altogether unexpected, having regard to what was known about the industries dealt with in the charts. For example, it was known there was a big development programme in the railway industry, and that this was reflected in the demand for castings. Also the automobile castings industry was expanding quite rapidly, and again this was reflected in the tonnage. There was obviously room for variations in stocks, or variations in the life and usage of ingot moulds; by and large, however, the tonnage produced was a reflection of the strength of the demand. He was glad to say that the market for automobile castings was still running quite strongly. Other sections, however, were not, and that situation was reflected in the figures. It was interesting that there was no country in the world, so far as he knew, and certainly none on the Continent, where such accurate figures were available.

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Demand for Pig-iron

The section of the report headed "pig-iron" referred to price increases, which were almost entirely due to the increased cost of coal, wages and so on. Incidentally, he thought the later pig-iron prices did reflect a greater recognition of the necessity to cover replacement costs for blast-furnaces, a factor which had not been fully covered by the previous permitted prices. Maximum prices of pig-iron were laid down by the Iron and Steel Board, and that position seemed likely to continue, so far as he could see. In view of the fall in the demand for pig-iron, stocks had been rising and there were considerable quantities available for export. In fact the exports became quite significant earlier in the year and, rightly or wrongly, the Board of Trade and the Iron and Steel Board decided to impose restrictions on exports. Those restrictions still applied, but he believed that most of them would recognize that the licences were being given now at a rate which did not make the existence of export restrictions a very serious factor. The other factor dominating the pig-iron situation was that the demand of the steelmakers at the moment for basic iron had helped to keep the blast-furnaces occupied.

Coming to the section on "Price Control of Iron and Steel Scrap," Mr. Marshall said the prices were controlled by Government order, a practice dating back to the war years, and the prices, as was well known, were considerably below the free market prices. There had been successive price increases, which had not been recommended by the JIC, and which had been the subject of representations to the Iron and Steel Board from time to time. But iron and steel scrap prices were still substantially below the free market prices. With regard to the Clean Air Act he could not tell the meeting about the results of the enquiry and he did not yet know what conclusion it would be possible to draw. It would be rash for him to prophesy whether the whole of the Council's representations would be accepted or only some of them. All he could say was that the Council's representatives who had assisted in the work had proved to be excellent witnesses at the enquiry, and that certainly they had done their best.

Training and Education

The section on "Training and Education" occupied more than two pages of the report, and for an excellent reason, that it represented very good work, in his opinion, for the future of the industry. A lot of work was being done on the quality of the raw materials and of the castings produced by the industry, and it would be completely illogical to exclude from consideration the problem of the availability and the quality of the men who, in the future, would replace the present executives. The industry had not had things all its own way in that connection. It was in severe competition with other industries for suitable men from a limited supply. The events of a few years ago could not be altered. Some had passed through certain courses of education and were at the threshold of their careers, and they would be attracted by one industry or another. Their usefulness would depend on how they were treated and trained and on what use was made of their abilities.

The type of men the industry would require in the future would be different from those of to-day. It might be that either too much or too little emphasis was put on craft training. The Council's training and education committee, which had formerly functioned under Sir Harold West, and was now under the chairmanship of Mr. Kenneth Davis, was still searching for the answers and in order that they might come to their conclusions on the best possible basis they had sought the advice of consultative panels throughout the country. Two or three things had been done and could be pointed out as an indication of future policy. One was the development of the residential courses for iron-foundry supervisors, and a very warm tribute should be paid to those who had given their time so generously to lecture to the men who enrolled. The courses were very well attended this year, and there were some men who were waiting to go next year. The courses were held three times a year, and those who took part undoubtedly learned much, not only from their teachers but from each other.

Foundry Apprentice Competition

Another significant matter was the desirability of expanding the National Foundry Craft Training Centre. Originally the JIC had thought in terms of establishing training centres in most of the important foundry districts; but they had found themselves with just one Centre and they had had to attach a hostel to it. It had been found possible to draw boys from places all over the country, and the trustees and the management committee were unanimous in the view that it was the right thing to have just the one centre, of a standard according with the demand. There had, however, been such a striking increase in enrolments of students over the last year or two that the trustees were examining a scheme for expanding the Centre. The JIC provided the basic income for the Centre, though there were some modest contributions from some other sections of the foundry industry.

With regard to the European Foundry Apprentice Competition at Stuttgart, from November 25-30, the president of the Institute of British Foundrymen, Mr. J. Blakiston, and Mr. John W. Gardom were present; Mr. Gardom, at very short notice, had not only joined, but had formed the backbone of, the selection team at Wolverhampton a few weeks previously; the JIC had confidence that he and his colleagues had picked a strong team of boys representative of the whole foundry industry in this country. Whether or not it was found that the team could beat the continental countries on their own ground, Mr. Marshall believed that the British foundry industry would be fortified by the knowledge of where its trainees stood and should have renewed confidence in the future.

It was difficult to speak on the "Health and Safety" section of the report without a feeling of

personal sorrow at the loss of Mr. Colin Gresty, for right from the beginning the work on health and safety seemed inexorably to be connected with his leadership. Mr. H. A. Bonney had stepped into the breach as chairman of the Safety Committee.

Pneumoconiosis was a shadow over the industry, but, whilst legal cases were not conclusive, it was significant that one company had had a most important case withdrawn recently after a short hearing. No great encouragement could be drawn from that because the threat to the industry remained, and there existed, very strongly, the view that more knowledge was needed; it was hoped to obtain more data on which a truly reliable opinion could be formed. The industry now had the active support of a strong team of doctors, who, with the agreement of their firms, were giving their services in an attempt to find the basic cause of the trouble.

European Common Market

The European common market, dealt with in the next section of the report, was being given careful thought. During the last week or so there had been moves to ensure that the United Kingdom had a voice in the developments on the Continent. A committee had been formed to work out the details, and the intention of the Government was to see that the new European free trade area started at the same time as the European common market, and to work out their programmes to a time-table. It was true to say that the interests of the steel industry and the iron industry were closely bound up with those of their customers, but Mr. Marshall thought the customers would have to pay a somewhat higher price for iron as well as for steel. That might stimulate the industry to greater efforts in technical development.

Speaking of the work of the European Committee of Foundry Associations on the Continent, he said that committee considered all matters concerning the industry including demand and the stimulation of demand, health, training, the European common market, and so on. Mr. Marshall believed this country could continue to derive advantage from comparing itself with the Continent.

Research and development, he continued, called for further work. It must be accepted that the industry as a whole had an interest in the services given by the British Cast Iron Research Association, and it was clear that those services could not be maintained at the present level without further finance. And, more important, the work on health and foundry atmospheres could not be developed adequately unless there were a sufficient foundation for the work; he was thinking in terms of buildings and equipment, and so on. In his view it would be wise for the industry to look upon that as a very special target, and the method of financing the work had yet to be devised.

In conclusion, the president submitted *seriatim* to the meeting the sections of the annual report and invited comments.

Questions and Comment

MR. MALCOLM J. GLENNY (Dover Engineering Works, Limited, and deputy chairman, Council of Ironfoundry Associations) said that anything the British delegates wanted discussed could be discussed by the European Committee. Furthermore, they had much to learn from the meetings, and particularly after the meetings, when the British representatives could mingle with those from other countries, and talk as man to man. He thought other countries were just as nervous as the United Kingdom itself about the whole position in Europe and had just the same problems to face. He did not think now that British industry had so much to fear as had been thought before they had attended the meetings.

THE PRESIDENT added that the European Committee was now discussing a form of standard costing, so that all could quote "like for like," and when figures were quoted they would be known to be comparable.

MR. J. BELL (Sir W. G. Armstrong Whitworth & Company (Ironfounders), Limited) asked if the European Committee were representative of all the countries in Europe.

THE PRESIDENT replied that the foundry industries of Belgium, Denmark, France, Federal Germany, Holland, Italy, Luxembourg and Spain were represented, together with the United Kingdom.

MR. GLENNY said that Great Britain was ahead of other countries in statistical work. The representatives of the JIC had said they would be ready to give certain information; that might be of some advantage in that, if they received information from the industry in Britain in the future, they might follow similar lines. It might be of very considerable benefit.

MR. G. B. JUDD (Mann, Judd & Company, joint secretaries, the National Federation of Engineering and General Ironfounders) said the director had quite properly deplored the coal-cost spiral. Had the Council made representations to the Ministry of Power or to the National Coal Board, or through the Iron and Steel Board? Although it was the Government's declared intention to fight inflation, he felt that anything the Council could do to stiffen them in that intention might be helpful.

THE PRESIDENT said that was a difficult question to answer. It seemed evident that at the moment the Government were quite determined to defeat the constant rise of prices. In one way or another the Council drew attention to the fact that the increasing price of coal was putting up the prices of the industry's basic raw materials.

THE DIRECTOR said the matter had been thoroughly debated by the coal utilisation councils, one dealing with domestic and the other with industrial usage, and the latter had stated that the thing had just got to be accepted. The JIC had also conveyed its views to the National Coal Board on the question of the spiral. But it was extremely difficult to see how one could change their views; the Ministry had authorized the prices and there seemed nothing more that the Council could do.

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Coal Prices

MR. S. B. RIPPON (Newton Chambers & Company, Limited) raised another point which was important in view of the inflationary spiral. Founders were being pressed, particularly by the National Coal Board and industry, and by Government departments, to quote firm prices. He asked what the views of the JIC were on this matter.

THE PRESIDENT replied that, speaking as an engineer, he was under the same pressure, and far from achieving what the Government wanted to achieve, such requests were enforcing further inflation, because in his industry they were forced to quote prices for a long term ahead. That came within the purview of trade associations concerned with prices rather than the JIC.

In connection with the European Apprentice Competition, MR. MARSHALL said the JIC appreciated the tremendous effort of the Institute of British Foundrymen, and the work put into it by their secretary and committees. They had been handicapped by the fact that the matter had arisen during the conventional holiday period; nevertheless, they had done extremely well.

MR. J. BLAKISTON (president, Institute of British Foundrymen) conveyed the thanks of the Institute to the JIC for the financial assistance it had given to the Institute's research work. He said that in return the Institute gave the industry the voluntary efforts of a large group of people of the highest technical qualifications, who were working for the benefit of the industry as a whole.

THE PRESIDENT thanked Mr. Blakiston for his remarks and assured him, if the assurance were needed, that the JIC very much appreciated the co-operation of the Institute.

Conclusion

THE PRESIDENT expressed his thanks to the vice-president (Mr. S. W. Martin, Staveley Iron & Chemical Company, Limited), to the chairmen of all the committees and sub-committees and to the committee-men for the really magnificent support they had given him, both in the JIC and the CFA, during his term of office. Thanking the director and staff, he said no chairmen or committees could do their job properly without the support, collaboration and enthusiasm of the permanent staff, and he was anxious to express his appreciation to them.

British Cast-iron Research Association

The thirty-seventh ordinary general meeting of the British Cast Iron Research Association was held at the Connaught Rooms on the same day as the JIC meeting, with Mr. J. J. Sheehan, B.SC., A.R.C.SC.I. (the retiring president), in the chair.

THE CHAIRMAN proposed that the report of the Council, and the accounts as audited and certified by the Association's auditors, and submitted to the meeting, showing the position of the Association's affairs as at June 30, 1957, be approved and adopted.

MR. S. H. RUSSELL, seconding the motion, drew attention to the part of the Balance Sheet which indicated that plans were in hand to spend a further sum of £100,000 by June 30, 1959, in addition to firm capital commitments of £14,000 at June 30, 1957. He informed the members that plans for two of the extension projects, the foundry-atmospheres block and cupola installation, were in an advanced stage. Completion of these projects would reduce the Association's liquid resources to approximately £80,000 at June 30, 1959; an absolute minimum and a figure below which it would be very dangerous to go.

Election of Officers

Council

The meeting re-elected the following members of Council, who retired automatically under article 29 and were eligible for re-election:— Mr. D. K. Barclay; Mr. W. Barnes; Mr. G. R. Buckley; Mr. E. Freer; Mr. H. G. Hall, F.I.M.; Mr. R. S. M. Jeffrey, B.SC., F.R.I.C.; Mr. G. H. Johnson M.I.MECH.E., F.I.M.; Mr. N. P. Newman, J.P.; Mr. E. S. Renshaw; Sir Frederick Scopes, M.A., and Mr. R. Taylor. Mr. E. Player, C.B.E., who had been appointed a member of Council in July, 1957, in accordance with article 31 was also elected. The following were then elected members of Council in accordance with article 25:— Mr. J. Blakiston, M.I.MECH.E., M.I.PROD.E. (president of the Institute of British Foundrymen); Mr. W. H. Harper, and Mr. P. A. Russell, B.SC., F.I.M.

President

DR. J. E. HURST proposed that Mr. E. Player, C.B.E., be elected president of the Association in succession to Mr. Sheehan, who was retiring. DR. Hurst said Mr. Player was managing director of Birmid Industries, Limited, having succeeded Mr. Percy Pritchard, who, unfortunately, had died during his period of office as president of the Association. To Mr. Pritchard (and to Birmid Industries, Limited) the Association owed a very great debt of gratitude, because it was during his period of office that he came to its aid and enabled it to move its headquarters from St. Paul's Square to Bordesley Hall. Therefore, it was particularly fitting, he said, for Mr. Player to be elected president. To those who had been connected with the foundry industry for a long time he was well known; he was a veritable creator of Sterling Metals, Limited, to which organization he had been attached during 48 of its 50 years of existence (its jubilee was celebrated in the early part of this year). Mr. Player had been created C.B.E. in the Birthday Honours last June, and he (Dr. Hurst) personally regretted, as did his many friends, that he was not able to be present at the Association's meeting on the present occasion; it was because he was engaged in his company's business in Australia. (The proposition was seconded by Mr. G. H. Johnson, and Mr. Player was duly elected.)

Retiring President

MR. H. G. HALL proposed that the warmest thanks of the Association be accorded Mr. Sheehan for his past services. Whilst, he said, the proposition could perhaps have been made more eloquently by others, it could not have been made more sincerely. Mr. Sheehan had been a wonderful president and a fine ambassador for the Association. MR. G. R. BUCKLEY, seconded this motion, which was carried with enthusiasm.

MR. SHEEHAN, in expressing his appreciation, said his period of office was terminated by retirement and a change of residence. Although he would reside in Ireland, he was continuing interests here; one of them, of course, being his association with the BCIRA, and particularly its Council. He had gained more from the Association than he had ever put into it, for it was one of the best associations of its kind in the country and one of the finest research associations dealing with cast iron in the world. He was very sincere about that, for he had been with it for nearly 25 years; so that it was his silver jubilee, and no doubt members would understand his anxiety to remain associated with the Council.

Vice-Presidents

The following were re-elected vice-presidents of the Association in accordance with article 24:—Sir Vincent de Ferranti, M.C.; Mr. Francis D. Ley, J.P., T.D.; Major R. Miles, B.SC., M.I.MECH.E.; The Rt. Hon. The Lord Mills of Studley, P.C., K.B.E.; Mr. W. T. Wren, and Mr. J. Blakiston, M.I.MECH.E.

MR. S. H. RUSSELL, proposing the warmest thanks of the Association to Mr. H. J. V. Williams, the vice-president who retired, assured the meeting that he was by no means a "casualty"; the Association had a much heavier job for him next year than that of being a vice-president. However, he had occupied that position *ex officio* during his year of office as president of the Institute of British Foundrymen. In it he had shown a very great interest in the work of the Association and had served as chairman of its Development Committee and members would wish to thank him very sincerely for his great services.

(This resolution also was carried with acclamation.)

Honorary Members

The meeting unanimously elected Mr. J. J. SHEEHAN, B.SC., A.R.C.SC.I., and MR. P. E. MAJOR, F.C.A., honorary members of the Association, and in addition placed on record the appreciation of the work of Mr. Major, who was retiring from the position of honorary treasurer. Mr. Pearce asked that this message be passed on to him from the meeting as a tribute to him for the excellent work he had done, especially at a very difficult time.

Council, Committees and Chairman

MR. J. BLAKISTON proposed that the warmest thanks of the meeting be accorded to the Council, committees and sub-committees for their work during the year. When one read the various reports that were produced, he said, it was not always realized the tremendous amount of spade work or backroom work that had been put into them; development work was becoming of more and more importance.

MR. R. S. DARBY, in seconding, paid tribute particularly to the chairmen of individual committees. Those who did public work or who served on committees in commercial life—and there must be many such present at that meeting, he said—must know that a chairman must listen, consider, guide, decide, and then terminate at the right moment.

MR. N. P. NEWMAN proposed with very great pleasure the warmest thanks of the meeting to the chairman for having presided. It was always very difficult, he said, when one had a very limited vocabulary, to express thanks adequately in words, but perhaps the nicest way in which he could express all that the members felt for Mr. Sheehan was to wish him every happiness and many years of enjoyment in his new home—or, perhaps one should say, back in his old home—in Ireland.

MR. M. M. HALLETT seconded and endorsed Mr. Newman's remarks with exceptional pleasure. All felt very sad that the occasion was the last on which they would have Mr. Sheehan with them in his official capacity, and in all sincerity they wished him the very best in his retirement.

MR. SHEEHAN, responding very feelingly to the vote of thanks, which was accorded enthusiastically, said that the thought of going back to where he came from had sustained him all his life—not only in Mexico and Colorado, but also in the Black Country. He was all the time thinking of farming and fishing, but he had reached an age when he could fish only on fine days, and on fine days one did not catch many fish. He came from a farming community, and farming had always intrigued him, yet his association with the Council and the BCIRA, as a whole had been a great compensation for his loss of farming experience.

Director and Staff

MR. SHEEHAN then paid tribute to the director and staff of the Association and their work. He recalled the very long association he had had with Dr. Pearce and could remember the early days when the equipment at his disposal was rather pathetic. He had a good staff, however, and he remembered particularly Mr. Morrogh, and the capacity and enthusiasm he had brought to his job. Again, he could remember Mr. Parkes working in the sand laboratory, having only a table and one instrument. He recalled Dr. Angus joining the Association and then, some five years ago, Mr. Whiteside coming. It was clear to all how fortunate was the Association, and the DSIR, to have such dedicated people as Dr. Pearce, Mr. Morrogh, Dr. Angus, Mr. Parkes and Mr. Whiteside. Mr. Sheehan said he felt very strongly about this; in his own office he had had the intermittent help of members, including Dr. Hurst and Mr. Russell; but without the help of a dedicated staff the Association could not have helped the country and the industry as it had done.

National Society of Master Patternmakers

Some Past and Future Activities

The National Society of Master Patternmakers have announced that the following have been admitted to membership:—Barnards Foundry, Limited, of Norwich; Richard Baxendale & Sons, Limited, Chorley, Lancashire; Sutton Patterns, Limited, Sutton, Surrey; Swalwell Pattern Company, Limited, Darlington; W.C.M. Pattern Making Company, Leamington Spa, Warwickshire; and Swale Foundries Limited, Aycliffe, Darlington. The total membership is now 82.

Timber Development

A report of the Society's representative on the Timber Industries Council was recently presented. The view was expressed that the timber trade and timber industries were probably more vulnerable to the economic effects of the European Common Market and Free Trade Area than most. The timber trade was primarily concerned with the home market, but it was thought the exporting industries would benefit most and that the UK would be drawn into direct competition with the countries of Western Europe whose conditions of employment, taxation and fiscal policies were very different. From the point of view of timber development alone, there were serious dangers inherent in the situation and it was necessary that there should be much closer working co-operation with the European timber industries than there was at the moment.

It was agreed that the Timber Industries Council should become a member of the Society and would co-ordinate the views of the various timber-using industries to avoid as far as possible unnecessary differences between them being turned to the advantage of their Continental competitors. In connection with this, the Society's representative had informed the Council that they attached particular importance to project No. 47—moisture-retardant and dimensional-stabilization treatments—since the movement of timber was a serious problem. It had been agreed that the question of stabilization should be regarded as a matter deserving some priority.

As to financing research in the timber trade, the Chairman had suggested that a statutory levy should be made to cover this. No commitment was being sought and before a statutory levy was introduced each manufacturing industry would be approached by the Board of Trade asking what the wish of the particular industry was with regard to the proposal. It was felt that as long as the levy was kept to such a sum of one shilling per standard, this might be acceptable.

1957/58 Programme

The Society's report to members included the following comments on the programme:

For the visit to the North-East Coast area on October 15, thanks were due to Mr. Storey and Mr. Werge, local Council members, for their hard work on behalf of the Society in connection with the trip. It had been a wonderful experience, particularly for patternmakers not domiciled in the area, to see how much went into building a ship. The activity "on the stocks" at Vickers-Armstrong's Limited, naval shipyard, Newcastle-on-Tyne, was a most heartening sight. The visitors were received at the yard by Captain Sismore, personnel manager, and shown through the model room, joiners' shop, fitting-out basin, and loft. They were very impressed with all they saw and heard, particularly the arrangements made by the firm for the training of apprentices.

In the evening a dinner was held at the Douglas Hotel, followed by an entertainment and there it had been most pleasing to see patternmakers from all over the country making fresh acquaintances and enjoying an evening together. It has now been decided that, in addition to other friends, ladies shall be allowed to participate in future visits.

The Society's annual dinner-dance has been arranged for Friday, May 2, 1958, at the Strand Palace Hotel, London, W.C.2, followed by the annual general meeting at John Adam House, John Adam Street, Adelphi, London, W.C.2, at 9.30 a.m. the next day. The price of each ticket has been retained at 50s. as in previous years and further details will be announced in due course. Meanwhile individual members were recommended to make their own arrangements for accommodation and if they write to the Strand Palace Hotel, mentioning that they are attending the dinner-dance of the Society they will get preference.

An invitation has recently been extended to members of the Society to visit the Shell refinery at the Isle of Grain. The party would leave Shell Mex House, London, at 9 a.m., spending the whole day at the refinery, arriving back in London at approximately 6 p.m. Members who would be interested in such a visit in the spring should notify the secretaries accordingly.

Shortweight Frauds Alleged

Charges of conspiracy, false pretences and thefts were brought in Sheffield on November 11 against a Sheffield firm of iron and steel merchants, its secretary, one of its directors, some employees of the firm and of customer-firms. It was alleged that there had been "blatant frauds" and "barefaced thefts" arising from shortweight deliveries and consignments of material adulterated with sand and scale. There were 78 summonses and 44 prosecution witnesses were expected to be called, and the case anticipated to last about seven days. It was alleged that on 40 occasions scrap had been delivered and the wrong figure quoted for the tare weight of the vehicle, resulting on 38 occasions that the customer got a ton too little, on one occasion two tons too little, and on another half-a-ton too little. The customers had paid over £477 for metal they had not received. In another case it was alleged that a foundry was in the habit of selling heavy steel scrap to the merchants and bought light steel scrap from them. There was no weighbridge at the foundry and it had been the practice for the merchants' lorry driver to load up and the next day give the weight of the scrap he had taken the day before. False weights, less than the amount taken, were given so that the merchants paid for only part of the load. From September to November, 1956, metal worth £184 2s. 7d., it was alleged, was stolen by this method.

Latest Foundry Statistics

Steelfounding: On September, 1957, according to the monthly statistics issued jointly by the Iron and Steel Board and the British Iron and Steel Federation there were 20,450 people employed in steel foundries, which showed an increase of 270 over the August figures, and 140 more than a year ago. The average weekly production of steel castings during September was rated at 7,000 tons as against 5,500 tons for August and 7,900 tons for September, 1956, but these figures still being provisional.

ACAFE Study Tour

Visit of Asian Experts to UK Iron and Steel Works

A team of seventeen experts from nine Asian countries visited this country between October 26 and November 7 to study foundries, iron and steel plants and laboratories. The tour, which included other North West European countries was part of the programme of the United Nations Economic Commission to Asia and the Far East (referred to as ACAFE). The UK part of the programme was devized by the Ministry of Power with the assistance of the British Iron and Steel Federation and the Steel Works' Plant Association and the British Council was responsible for detailed planning and administration.

Participants in the study tour were Mr. U. Soe Myint (Ywama, Burma); Mr. U. Than Maung (Department of Mines, Rangoon, Burma); Mr. Tze Han Fu (Taiwan Steel Works, China); Mr. Mao Hwa Po (Industrial Development Commission, Taiwan); Mr. B. N. Gupta (Prakash Engineering Company and Rolling Mills, Agra, India); Mr. S. S. Belavadi (Mysore Iron and Steel Works, Bhadravati, Mysore State); Mr. Otong Kosasih (State Planning Bureau, Djakarta, Indonesia), Mr. Soebroto (Metal Working Industries, Department of Industry, Djakarta, Indonesia); Mr. Tsuneyoshi Rokujo (Ministry of International Trade and Industry, Tokyo); Mr. Atsuo Nakajima (Heavy Industry Bureau, Tokyo); Mr. Wong Sang Riu (Dai Han Heavy Industry Corporation, Seoul, Korea); Mr. Mann Kiew Dgeong (Ministry of Commerce and Industry, Seoul); Mr. M. A. Majid (Ministry of Industries, Karachi); Mr. Vicente W. Serrano (National Shipyards and Steel Corporation, Iligan City, Philippines); Mr. Bernardo P. Abrera (National Shipyards and Steel Corporation, Manila); Dr. Prom Vajra Gupta (Department of Metallurgical Works, Ministry of Industry, Bangkok) and Mr. Vichitr Namatra (Department of Metallurgical Works, Ministry of Industry, Bangkok). United Nations officials who accompanied the group were Mr. V. M. Subramanian (chief of the Iron and Steel section of ACAFE) who was technical secretary of the group and Mr. Otto Reichwald who was the technical director of the tour.

FIG. 1.—*Some of the Asian visitors watching the operation of a Speedslinger at the Tame Bridge foundry of W. & T. Avery, Limited.*

After initial discussions in London with the Ministry of Power and the British Iron and Steel Federation, the participants travelled to Sheffield and visited the steel works of the Park Gate Iron and Steel Company, Limited; English Steel Corporation, Limited, and Davy and United Engineering Company, Limited. A visit was also paid to the research laboratories of the British Iron and Steel Research Association. The Scunthorpe plant of Appleby-Frodingham was seen and the team also went to Joshua Bigwood & Son, Limited, to see the manufacture of auxiliary processing equipment.

Tame Bridge Foundry

When the group visited the Tame Bridge foundry of W. & T. Avery, Limited, it was received by Mr. Shore, general superintendent of foundries, who gave the visitors an outline of the organization of work, prior to the party being escorted around the foundry in small groups (Fig. 1). It will be remembered that this foundry has only recently been opened and is reputed to have manufacturing facilities and workpeople's amenities above the average. The works is claimed to be the most modern of its kind in the country, having been planned with the object of conserving skill by the provision of mechanical aids wherever possible. One of the most advanced production units is the pattern-flow section and much interest in this and other main foundry sections was shown by the visitors.

Vacancies and Unemployed

Numbers of unemployed and vacancies in the period mid-September to mid-October were within 1,000 of exact statistical balance. Vacancies at 274,000 fell below the 275,000 unemployed for the first time since June. Excess of male workers unemployed over vacancies is 49,000, while there were 134,000 vacancies for women to 86,000 unemployed.

Although the employment figures cannot be taken as an accurate picture of the labour situation as many employers, particularly of skilled grades, do not report all vacancies to the exchanges, the Ministry of Labour figures are being increasingly used as a key indicator of inflationary pressure.

The most intractable labour shortages would appear to be for craftsmen in such industries as engineering and shipbuilding, and in coal mining. Changes in September were principally seasonal. There was no change in the numbers employed in mining and quarrying (865,000), and in gas, electricity, and water undertakings there was an increase of 1,000 (378,000). In the manufacturing industries there was an increase of 1,000 in chemicals and allied trades (530,000), 3,000 in metal manufacture (585,000), 7,000 in vehicles (1,218,000), and 13,000 in engineering, metal goods, and precision instruments (2,806,000). Over the whole of the basic industries there was a drop of 7,000 and an increase of 31,000 over the whole of manufacturing industries.

Company News

DOVER ENGINEERING WORKS, LIMITED—An interim dividend of 5 per cent. is announced. No interim payment was made last year, when the total was 10 per cent.

AUSTIN & PICKERSGILL, LIMITED, shipbuilders, of Sunderland—Group profit, before taxation, has advanced from £138,641 to £194,352 in the year to June 30, 1957, and the dividend is increased by 5 per cent. to 15 per cent.

TUBE INVESTMENTS, LIMITED—Trading profits of the subsidiaries rose by about £1,000,000 to £15,650,685 and the group net profit is up from £5,271,209 to £5,510,909. The final dividend is unchanged at 7½ per cent., making, with the increased interim, 15 (13⅓) per cent. for the year.

YARROW & COMPANY, LIMITED, shipbuilders and marine engineers, of Glasgow—Group profit is £218,811 (£165,493) and a dividend of 17½ per cent. on the £600,000 capital, as increased by a 33⅓ per cent. free scrip issue, is announced. This is a rise of 2½ per cent. on the previous year's 15 per cent. equivalent.

GUEST, KEEN & NETTLEFOLDS, LIMITED—In order to reduce the disparity between interim and final rates as declared for 1956, an interim of 5 per cent. is to be paid on the increased capital of £30,378,515. Dividends for 1956 were 3½ per cent. interim and 10 per cent. final on £23,137,790. The directors state that having regard to the latest information on group earnings, a 13½ per cent. total will still be fully justified.

BRITISH TIMKEN, LIMITED, roller bearing manufacturers, of Aston, Birmingham—The company proposes to make rights and scrip issues. As a preliminary, an extraordinary meeting is called for November 25 to increase the capital to £5,000,000 by creating 1,000,000 ordinary £1 shares. It is the director's present intention to issue part of the new capital by a scrip issue and to offer the remainder to ordinary shareholders for cash.

S. SMITH & SONS (ENGLAND), LIMITED, makers of aircraft and marine instruments, motor accessories, etc., of London, N.W.2—Treasury consent has been obtained for a one-for-one ordinary free scrip issue, which will involve capitalizing £2,890,979 of past profits. Group profits declined from £2,635,274 to £2,333,495 in 1955-56, but rose in the year ended August 3, 1957, to £2,847,193. The final dividend is increased by 2½ per cent. to 15 per cent., making 20 per cent. for the year.

SAMUEL OSBORN & COMPANY, LIMITED—CIC consent has been obtained for a one-for-one scrip issue and, if justified by profits, the directors propose to make the same total distribution for 1957-58, being the equivalent to 20 per cent. on the increased capital. In addition to maintaining the 32½ per cent. dividend with a 20 per cent. final, a cash bonus of 7½ per cent. (to make 40 per cent. for the year) is announced. Group manufacturing and trading profits, subject to audit, totalled £1,289,004 (£1,256,122).

HATTERSLEY (ORMSKIRK), LIMITED, engineers and iron and non-ferrous founders, of Ormskirk (Lancs)—An unchanged interim dividend of 7½ per cent. is declared by the directors, although estimated group trading profits for the first six months to September 30, 1957, are appreciably less. A final of 15 per cent. and a bonus of 10 per cent. made 32½ per cent. for the year to March 31, 1957. Capitalization of £500,000 of reserves to make a one-for-one scrip issue is proposed. CIC consent has been obtained for the issue of 2,000,000 5s. ordinary shares. The issue does not imply any increase in dividend.

National Investment Committee?

Such a disunity of purpose and misunderstanding among those who work in and are responsible for the well-being of industry—management, labour, and Government alike—has developed, that effort and enthusiasm are squandered, states Sir Ivan A. R. Stedeford, chairman of Tube Investments, Limited, in his annual review. All are responsible in varying degrees and the risk of costing ourselves out of world markets could be avoided if every section of the community took the trouble to understand that it shares with others, this one fundamental common interest.

Recognizing the financial and economic difficulties which the country has to face, Sir Ivan doubts whether changing official policies towards industry so often and so sharply is unavoidable, and he asks whether it is impracticable to give industry some broad forward assurance on which to plan. "Something on the lines of an advisory national investment committee seems to be at least as important as the new advisory body for wages and prices," he maintains.

The difficulties by which the company had so long been hampered in having no close association with a primary producer of virgin aluminium—its raw material—had led to the agreement with the Reynolds Metals group of America, the second largest producers of primary aluminium in the US. The American company would bring a great deal into the partnership and it would henceforth assume equal responsibility with TI for the management, operation, and development of their joint aluminium interests in the UK.

Notwithstanding the record results of last year and the likelihood then expessed that they would remain unchallenged, Sir Ivan said he was able to report another record year. The trading surplus before tax rose by over £640,000 to £11,974,000, despite the substantial addition to the provision for depreciation of £393,000. The final dividend proposed on the ordinary stock is 7½ per cent., making a total of 15 per cent. for the year to July 31, 1957.

Present Scene "Confused"

Although group turnover at £48,713,000 is nearly £4,000,000 up on the previous year, the real increase measured in physical volume is not in similar proportion, states Mr. H. W. Secker, chairman of Thos. W. Ward, Limited, in his annual review. Because conditions became more difficult throughout the past year, he considers the results achieved to be very satisfactory.

Total deliveries of scrap iron and steel had again broken all previous records. Apart from one or two minor exceptions all the firm's other interests had a successful year and the volume of trade was well maintained in the sections covering railway siding construction, supply and hire of machinery, merchanting of cement, structural steelwork, foundry supplies, and nut and bolt manufacture.

"The present scene is so confused that it is very difficult to make any clear analysis of future trends," states Mr. Secker. "It is rather a see-saw position where a change can take place very swiftly either way," and he adds that it was inevitable that in the absence of any special opportunities for extra profit arising, there would be some further reduction in group profits. Trading profits were £3,006,383 (£3,088,406). A bonus of 5 per cent. has been added to the maintained 15 per cent. dividend.

News in Brief

WESTLEY BROTHERS, LIMITED, non-ferrous founders, has plans in hand to build extensions to the works at Doulton Road, Old Hill, Cradley Heath, Staffs.

BUTTERLEY COMPANY, LIMITED, Ripley, are selling a prize herd of 200 Red Poll cattle, as the Coal Board require the land upon which they grazed for open-cast mining.

Mr. J. L. HEPWORTH, joint managing director of Hepworth & Grandage, Limited, engineers, Bradford, presented awards to apprentices at a ceremony held in the staff canteen recently.

SCIENTIFIC FILM ASSOCIATION organized for Tecalemit, Limited, a meeting on "Films and Automation" in Plymouth on Friday, November 8 which was attended by over 320 representatives from industry and education in the South West.

GENERAL REFRACTORIES, LIMITED, Genefax House, Sheffield 10, have issued a chart for the rapid estimation of temperature gradients and heat losses through furnace walls, together with the physical properties of the materials which they manufacture.

A WEST GERMAN CONCERN, Gebr. Claas Maschinenfabrik, of Harsewinkel, has placed a large order with F. Perkins, Limited, Peterborough, for four-cylinder L4 diesel engines for the model SF55 self-propelled combine which the German firm manufactures.

TWO MEN were killed in an accident at the Lackenby steelworks, Middlesbrough, of Dorman, Long & Company, Limited, on November 9. They were repairing a steel furnace when two heavy castings fell and the men with them. A third man was seriously injured.

AN OFFER by Tube Investments, Limited, to provide a research scholarship in the Department of Mechanical Engineering at Sheffield University was accepted by the University Council on November 15. The first holder will be Mr. D. Westwood, a mechanical engineering graduate of Birmingham University.

Mr. E. MENSFORTH, managing director of Firth Brown Tools, Limited, Sheffield, presented a silver model of a Westland Whirlwind helicopter, which is made by the company of which he is chairman, to the Duke of Edinburgh when he visited the works at Yeovil, Somerset, on November 15.

E. W. WYNN (IRONFOUNDERS) LIMITED, of Bridgetown, have been refused permission to erect a foundry on a site at Spinny Farm, Wolverhampton Road, Cannock, by Staffordshire County Council's planning sub-committee. The reason given, is that this land is allocated as a public open space, and may also be partly affected by the diversion of a road.

LADY ROBERTS, wife of Sir Peter Roberts, M.P., chairman of Newton Chambers Limited, opened a sale of work at the firm's Thorncliffe Works, Chapeltown, on November 12. The sale was organized by the works' three netball teams in aid of club funds. In the absence of Mr. P. J. C. Bovill, managing director, the Rev. F. Gouge, vicar of Chapeltown, presided.

A FIRE at the works of Hall & Pickles, Limited, steel manufacturers, Sheffield, on Monday night, November 11, affected some 500 sq. ft. of roofing. The alarm was given at 10.15 p.m. and firemen from Sheffield and Hoyland fought the flames and quickly brought them under control, though much of the roof was damaged. Firemen remained on the scene until the early morning.

SHEFFIELD has the finest technical library outside London and one of the finest in the world, said Alderman A. Ballard, Lord Mayor of Sheffield, when he spoke at the annual dinner of the Sheffield branch of the Electrical Contractors' Association (Inc.) at the Royal Victoria Hotel, Sheffield. He added that Sheffield University claimed the world's first department of glass technology.

TO CELEBRATE ITS CENTENARY, W. N. Baines & Company, Limited, iron and non-ferrous founders, of Rotherham, held a luncheon for employees and staff on November 8. Each employee received an engraved gift and toasts were made with champagne given by an associate company in Johannesburg. The company is a subsidiary of Bell's Asbestos & Engineering (Holdings), Limited, Slough (Bucks).

Mr. G. D. WHITEHOUSE, chief designer of English Steel Corporation, Limited, Sheffield, has returned from a visit to America. On the flight from St. Louis to New York he saw with other passengers in the aeroplane at about 10 o'clock at night a Sputnik for about 30 seconds. The pilot told them of the approach of the satellite and of the side of the plane from which it could be seen.

THE INSTRUMENTS, ELECTRONICS & AUTOMATION EXHIBITION, to be held at Olympia, London, in April, 1958, will be almost one-third larger in floor area than the 1957 exhibition, exhibitors were told at the official ballot for stand positions, held at the Connaught Rooms on November 15. The 1958 exhibition will again be accompanied by a conference, which will be international in character.

AN OIL PAINTING of the Cutlers' Forfeit Feast by the Sheffield artist, Mr. Edward S. Billin, was on view at the Society of Artists' exhibition which opened at the Graves Art Gallery, Sheffield on Saturday, November 16. The painting, which has taken three months to complete, was commissioned by Sir Peter Roberts, when he was Master Cutler, and was shown in the exhibition before being delivered to Sir Peter.

THE FORMATION OF A GROUP AERO DIVISION is announced by BTR Industries, Limited, its operations embracing all the existing interests and activities of the BTR Group in relation to the aircraft industry. Marketing unit of the new division will be Palmer Aero Products, Limited, a member of the BTR Group under its former name of the Palmer Tyre, Limited. Mr. C. G. Erlam has been appointed manager of the new division.

OFFICIALS of the AEU at the Maltby Royal Ordnance Factory which is being closed down, have approached Mr. R. Winterbottom, M.P. for Brightside, Sheffield, in connection with reports that Sheffield industrialists are seeking sites for factories because of the congested nature of Sheffield's East End. They are interested in the possibility as to whether the Maltby Factory could be made available for some of these concerns, in separate lots.

MCKESSON EQUIPMENT COMPANY, LIMITED, Market Place, Doncaster, is supplying 10 units of anaesthetic apparatus manufactured at their Eckington, Derbyshire, works, for health centres in Russia. The order was placed after a year's negotiations between the company's London office and the Russian Embassy. The company has previously fulfilled orders from Holland, Denmark, Norway, India, South Africa, Ceylon and Gibraltar, but this is the first order for Russia.

SHEFFIELD AREA INDUSTRIAL GROUP of the Royal Society for the Prevention of Accidents is organizing a "Better Housekeeping" campaign in the spring when the 175 member firms are being asked to take part. The idea, expressed by the secretary, Mr. W. H. Morris, to a group meeting on November 12 "is to

News in Brief

persuade managements to spring-clean their factories; to get rid of obsolete machinery which is often dangerous, and to instal new and safer machinery."

A NEWLY FORMED COMPANY of the Brush Group, Limited, National Free Piston Power, Limited, has announced that it is to receive a contract from the Zinc Corporation, Limited, London, E.C.2, covering the supply of a free-piston turbo-air compressor plant for installation at Broken Hill, Australia. The plant will consist of three National GS.34 free-piston gasifiers, one Brush (series 200) expansion gas turbine, direct coupled to an Oerlikon rotary air compressor.

THE ANNUAL PRESENTATION of awards to the winners of prizes for the Carron Works Recreation Club's activities was made recently. Mr. E. J. Leaver, manager of the Carron Company, looking at the imposing array of silver cups displayed, said he was impressed by the show of "ironmongery" and drew special attention to a very large and beautiful solid silver cup, not as yet apportioned to any activity. In 1911 it had been awarded for proficiency in first-aid. Now it stands to be won by outstanding effort.

THE COLES range of mobile cranes made by Steels Engineering Products, Limited, of Sunderland, was shown to more than 100 representatives of the iron and steel industries at a demonstration held recently at the company's Crown Works. The demonstration illustrated the many advances in design which the firm have made in relation to handling equipment for these industries. A conducted tour of the works, during which the production lines of the full range of cranes were inspected, completed the day's events.

AT THE CAR-JACK ASSEMBLING FACTORY of Metallifacture, Grant Street, Nottingham, extensive damage was done on Saturday afternoon, November 9, when a fire broke out on the first floor of the four-storey-high building. Four 10-ft. long tanks containing highly-inflammable paint were found to be ablaze, and machinery and components on the first and second floors were badly damaged. It is estimated the damage runs into thousands of pounds. It is expected that the assembling done at Grant Street will be transferred to the firm's Dakeyne Street factory in Nottingham.

IN THE THIRD QUARTER of this year, orders for oil equipment and materials placed with UK companies totalled £35,300,000, compared with £39,400,000 for the third quarter of 1956. The total for the second quarter of this year was £29,400,000. Orders for the year to September 30 amounted to £101,300,000 (£114,200,000). The principal categories of equipment ordered during the first nine months of this year were tubulars, pipe fittings, and valves (£18,300,000), and chemicals (£15,700,000). None of the figures include oil tanker orders.

THE BRUSH GROUP has engaged part of a Beirut hotel to organize an "on-the-spot" export conference of its agents and customers in the Middle East. It is expected that about 60 buyers from the Lebanon, Egypt, Israel, Jordan, Syria, Iraq and Iran will be present. There has been some fall-off in sales in the area since the Suez dispute. Among those who will attend is Mr. R. H. Hainsworth, managing director of J. & H. McLaren, Limited, diesel-engine makers, Leeds, who has taken with him a 10-minute film of men at work in the Hunslet factory. The conference opens on November 25.

THE COMPETITION promoted by Thwaites Engineering Company, Limited, in which a dumper is the prize and all proceeds are to be presented to the British Empire Cancer Campaign has raised a sum of £950. A cheque for this amount will be received on behalf of the Campaign by the Rt. Hon. the Earl of Woolton, C.H., P.C., during the prize presentation ceremony due to take place this morning at the company's stand at the Building Exhibition, Olympia. Mr. Harmer Nicholls, J.P., M.P., Parliamentary Secretary to the Ministry of Works will present the dumper, a 15-cwt. capacity, diesel-engined machine worth £350, to Mr. Michael Davis, director of the 107-year-old tile and fireplace manufacturing company of George Woolliscroft & Son, Limited, of Hanley, Stoke-on-Trent, who are the winners.

SANDERS & FORSTER, LIMITED, of Thames Works, Hertford Road, Barking, Essex, report that they have received an order for two of their 75-ft. span standard buildings to provide extensions to the exhibition hall controlled by Belle Vue (Manchester), Limited. These buildings, of tied portal frame construction, will be erected on each side of the existing hall and will be 14-ft. high to eaves. When completed they will provide an additional floor area of approximately 66,750 sq. ft. The roof will be clad with "Big Six" asbestos cement sheets, lined with half-inch insulation board over the purlins and patent glazing will be incorporated in each roof slope. The British Fair of Industry and Commerce July 14 to 19, 1958, will be the first exhibition to be staged in the enlarged hall. The architects for the building project are Drury & Gomersall of Manchester.

Changes of Names

Among companies which have recently changed their names are those listed below. The new titles are given in parentheses.

MOLE IRONWORKS, LIMITED, 15, High Street, Leatherhead, Surrey (Mole Properties, Limited).

"BP" WHEEL HOE, LIMITED, High Street, Downham Market, Norfolk ("B.P." Sheet Metal, Limited).

GRAHAM WEST ENGINEERING, LIMITED, 63/5, Piccadilly, London, W.1 (Graham West Properties, Limited).

TRANSPEX (LONDON), LIMITED, 11, Jubilee Place, London, S.W.3 (Belgrave Tool Company, Limited).

L. & N. (CROCUS STREET), LIMITED, Crocus Street, Nottingham (Huntfield Engineering Company, Limited).

TESOTT INDUSTRIES, LIMITED, 27, Moor Lane, Witton, Birmingham (Scott Precision Parts, Limited).

CARLTON PRECISION TOOLS, LIMITED, 78, North End, Croydon, Surrey (Carshalton Precision Tools, Limited).

MACHINE TOOLS (SALES), LIMITED, 77, Portland Place, London W.1 (Machine Tool Sales (London), Limited).

LOWE (CONTRACTORS), LIMITED, 38, Poole Road, Westbourne, Bournemouth (J. T. Lowe (Engineers), Limited).

TOPLIS, SIMPSON & COMPANY, LIMITED, 66, Hammersmith Road, London, W.14 (Kappa Moisture Meters, Limited).

BOURNE STEEL CONSTRUCTION COMPANY, LIMITED, St. Clements Road, Parkstone, Dorset (Bourne Steel, Limited).

HANWELL ENGINEERING COMPANY, LIMITED, Countess Road, Northampton (Pollard Bearings (Northampton), Limited).

E. M. THREADS, LIMITED, engineers, etc., of 6/8, Sackville Street, London, W.1 (Lawford Plant & Machinery, Limited).

PRECISE PRODUCTS, LIMITED, 241A, Rufford Road, Crossens, Southport (Precise Engineering Company (Southport), Limited).

ALEXANDER S. NEWALL MACHINE TOOL COMPANY (MANCHESTER), LIMITED, 31, Hamworth Road, Feltham, Middx (Microton, Limited).

KENURE, HESLOP & HOLT, LIMITED, engineers, etc., of 641/3, Staines Road, Bedfont, Middx (Kenure, Holt & Company, Limited).

KAYE'S (MIDDLESBROUGH), LIMITED, tool merchants, etc., of 63, Newport Road, Middlesbrough (Kayes (Middlesbrough), Limited).

FLETCHER & COMPANY (CONTRACTORS), LIMITED, engineers, etc., of Forest Road, Mansfield (Thomas Fletcher & Company, Limited).

SECOFRAME, LIMITED, steel frame manufacturers, etc., of 11, Upper Brook Street, London, W.1 (Uni-Seco (Overseas), Limited).

TEMPLEWOOD ENGINEERING COMPANY, LIMITED, Eastbourne Road, Trading Estate, Slough, Bucks (Templewood Hawksley, Limited).

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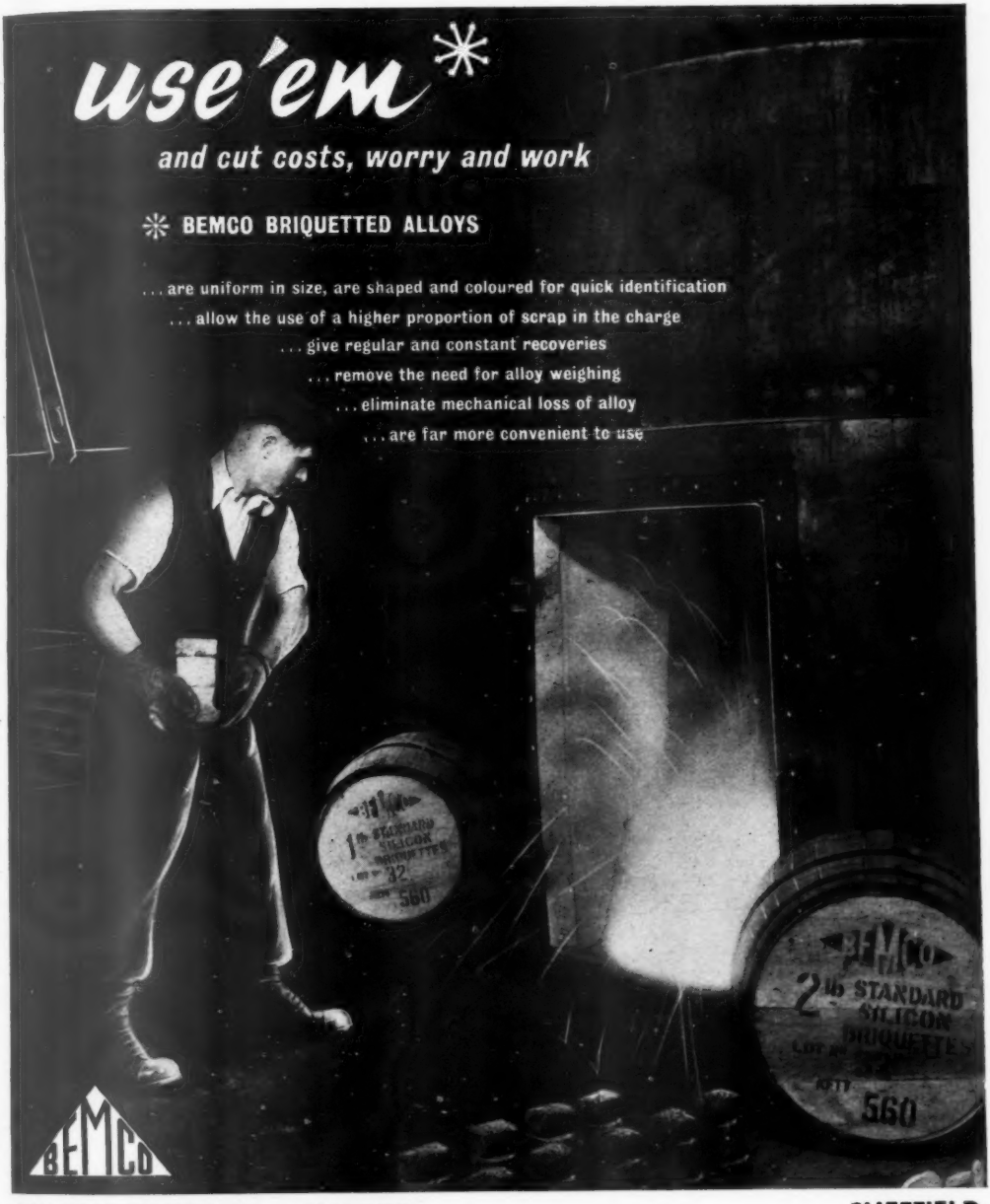

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Personal

Mr. L. GODBER, a local director and general manager, services, of Newton, Chambers & Company, Limited, Thorncliffe, near Sheffield, has been elected a Fellow of the Chartered Institute of Secretaries.

Last Tuesday at Buckingham Palace, Dr. J. G. PEARCE, the director of the British Cast Iron Research Association, was invested by Her Majesty with the insignia of the Companionship of the Order of the British Empire.

Mr. and Mrs. E. WOFFENDEN celebrated their golden wedding anniversary on November 9. Mr. Woffenden, who is 77, spent 50 years in the employ of Charles Roberts & Company, Limited, Railway Wagon Works, Horbury Junction, near Wakefield.

Mr. A. R. WIZARD of Morris Singer Company, Limited, leaves this country on Friday for a short business trip to the Eastern United States. With his chief designer, he is to investigate the development of curtain-walling, and expects to return on December 12.

Captain QUENTIN H. PATERSON, R.N. (RETD.), who has resigned from the position of joint managing director of Wm. Beardmore & Company, Limited, steel manufacturers, Glasgow, is to remain a director of the firm for the present with headquarters in London. Mr. P. M. THOMAS, joint managing director, has been appointed sole managing director.

An industrial advisory committee is to be set up for Malta, and Lord HIVES, until last January executive chairman of Rolls-Royce, Limited, has agreed to act as chairman. Also on the committee will be Sir GEORGE DOWTY, chairman of the Dowty Group, Limited, and subsidiaries. The committee will aim to encourage industrial development in the island.

After 55 years with the Appleby-Frodingham Steel Company (branch of the United Steel Companies, Limited), Mr. HARRY HAROLD ALLEN, a sampler, has retired. A presentation was made to him by Dr. T. S. Harrison, of the central laboratory, and tributes to his work were paid by former chief and assistant chief chemists, Mr. H. Hesson and Mr. J. Sudlow.

As Mr. J. JONES has now left the industry, there has recently been a change in the secretaryship of the North-Western Association of the Ironfounders' National Confederation. The present honorary secretary/treasurer of the Association is Mr. P. E. F. CREWDSON, Gilbert, Gilkes & Gordon, Limited, Canal Ironworks, Kendal, Westmorland (Phone: Kendal 28).

The Minister of Labour, the Right Hon. IAIN M. MACLEOD, P.C., M.P., will be the principal guest at the dinner which is to be given by the British Steel Founders' Association at Claridges on December 3. The dinner is given at two-yearly intervals, and is attended by members of the industry and their guests, who come from many important branches of the engineering industry.

Aero Research, Limited, Duxford, Cambridge, and Ciba, Limited, Horsham, announce that Air Commodore Sir ARTHUR VERE HARVEY, C.B.E., M.P., has accepted the chairmanship of the boards of directors of these two companies. In this appointment he succeeds Sir RAYMOND NEEDHAM, Q.C., who has been chairman since 1947 and remains a director of both companies. Sir Arthur Vere Harvey's industrial appointments include directorships of Carters Tested Seeds, Limited (chairman), Mullard, Limited, Handley Page, Limited (deputy chairman), and Philips Electrical, Limited.

Professor A. G. QUARRELL, head of the Department of Metallurgy at Sheffield University, has been inducted as president of the Sheffield and district section of the Junior Institution of Engineers. In his address he said that the stage of being able to decide in advance how to make an alloy with properties required for a particular application had not yet been reached. "Research has given us a remarkably clear understanding of the factors that determine the structure and properties of certain alloys, particularly of the simple ones that contain only two elements, but the modern alloys with exciting properties are almost invariably complex and frequently contain ten or more metals deliberately added."

Mr. LANGTON HIGHTON, managing director of Workington Iron and Steel Company, a branch of the United Steel Companies, Limited, will relinquish this position on December 31 on completion of 47 years' service. He will continue to be a director of United Steel and of its associated companies in Cumberland. Mr. T. S. KILPATRICK, director and deputy general manager at Workington, will be appointed director and general manager on January 1 next. Mr. D. R. WATTLEWORTH, who retires as director and general works manager on December 31 after 50 years' service, will be succeeded as general works manager by Mr. T. SANDERSON, who is at present assistant general works manager.

Mr. MILES BEEVOR has joined the board of Rubery, Owen & Company, Limited, the parent firm in the Owen organization. Mr. Beevor, who is 57, was educated at Winchester and New College, Oxford. He was admitted a solicitor in 1925 and was a partner in the firm of Williams & James, the London solicitors, until 1943. He served with the RAFVR from 1941 to 1943. From 1943 he was chief legal adviser to the London & North Eastern Railway until 1947, when he became acting chief general manager of the LNER. He was the first chief secretary and legal adviser to the British Transport Commission from 1947 to June, 1951, when he joined the Brush group as deputy managing director of the parent company. Mr. Beevor became managing director of the Brush group in October, 1952, and subsequently deputy chairman until the acquisition of the Brush group by Hawker Siddeley, Limited, in June, 1957.

Obituary

For many years foundry manager at the engineering works of Baker Perkins, Limited, Westwood Works, Peterborough, until he retired in 1950, Mr. J. W. CLARKE has died at the age of 73.

The death took place on November 6 of Mr. J. J. REYNOLDS, manager of the wages department of Thos. Firth & John Brown, Limited, steelmakers, of Sheffield, with which he had been for 40 years. He was 57.

Mr. WILLIAM MATTERSON, managing director of Matterson & Sons, Limited, ironfounders and loom manufacturers, of Coalville, Leicestershire, has died at the age of 72. He had been associated with the business for about 45 years.

The death is announced of Mr. ALFRED SCHOLES, who, until his retirement in 1954, was a partner in the Middlesbrough firm of Pattinson & Stead, public analysts and consulting metallurgists. He was 75. Mr. Scholes began his career in 1898 as a pupil of the late Dr. J. E. Stead, one of the founders of the partnership, and he became a partner himself in 1933. He was a past-president of the Cleveland Institute of Engineers, of the Cleveland Scientific and Technical Institution, and of the Middlesbrough branch of the Institute of British Foundrymen.

Greater loads... higher lifts... longer flights with

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RAYON CONVEYOR BELTS

A full range of rayon-carcass conveyor belts is available from Goodyear for applications where higher tension ratings are desirable. The special advantages of rayon belts make possible a fresh approach to new installations, and also help to eliminate many difficulties with existing installations.

Manufactured in three different weights of rayon and to a wide variety of cover specifications, we are able to supply the most economical belt for any type of service. With knowledge of your operating conditions we will gladly advise on the Goodyear rayon-carcass belt best suited to them.

Greater Efficiency

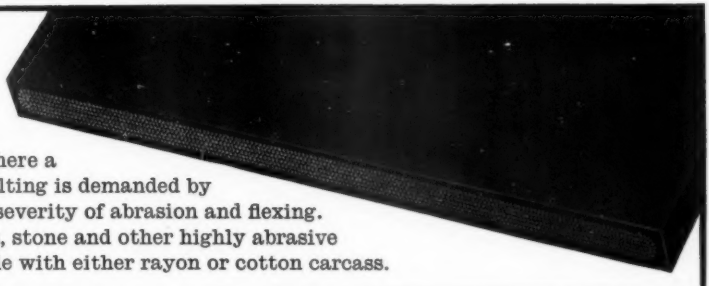
Higher tensions, with ample safety factor and less stretch, permit greater loads, longer flights and higher lifts. This means simpler layout, fewer transfer points and easier sequence control.

Better Troughing

The thinner construction ensures better troughing and less dead weight on highly-rated belts. The higher grades of rayon belting have ratings away above anything that is practical in cotton construction, and yet trough perfectly.

Longer Belt Life

Extra flexibility means that belts can wrap driving rollers and snub idlers more closely, yet retain the excellent impact resistance needed for loading points. Belts therefore last longer.



STACKER

Designed for use where a superior quality belting is demanded by the frequency and severity of abrasion and flexing. Ideal for coke, ores, stone and other highly abrasive materials. Available with either rayon or cotton carcass.

GOODYEAR

INDUSTRIAL RUBBER PRODUCTS

CONVEYOR BELTING · HOSE · V-BELTS · TRANSMISSION BELTING · FENDERS

Raw Material Markets

Iron and Steel

Production of pig-iron is maintained at high levels, and in most grades the tonnages available for distribution exceed current demands. Outputs during the year have continued to reach record figures, which up to the present give an average annual rate in excess of the original target of 14,000,000 tons, and will, it is expected, be nearer 14,500,000 tons. To meet the urgent needs of the steelworks, production has been concentrated mainly on the supply of basic pig-iron. For some time past, of the 98-100 blast furnaces in blast, 63 have been supplying this grade of pig-iron, which represents more than three-quarters of total outputs. These tonnages are now providing the steelworks with adequate supplies and dependence on imported supplies has virtually ceased. Consignments recently received from overseas have provided additional tonnages for stock, and these deliveries are likely to get less.

A reduction in basic pig-iron capacity of home furnaces has also taken place recently; in the Northamptonshire area one furnace has been banked down and another put on slack blast, while a third furnace in the Derbyshire area has been switched over from basic pig-iron to high-phosphorus foundry pig-iron.

In the foundry grades the low-phosphorus pig-irons for production of high-duty castings by the engineering and speciality foundries continue in biggest demand. Overall outputs of this grade just about cover consumption needs, although for some irons in this class many foundries could take larger tonnages. The increased demand for castings from the motor vehicle trade continues and this is providing a good level of work for the foundries which cater for them. Coupled with these are the demands for castings from other engineering and speciality foundries, machine-tool makers, power and electrical plant manufacturers, steelworks, collieries, and other users. These requirements cover appreciable tonnages, and apart from the low-phosphorus irons, hematite, and, to a lesser extent, the refined irons are also utilized by these foundries, both of which grades are in good supply.

The high-phosphorus pig-iron, which is chiefly used by the light, jobbing, and textile foundries, is plentiful and producers are anxious to obtain more business to enable them to clear their makes instead of having to incur additional expense in placing appreciable tonnages into stock which they are at present forced to do. Outputs have been increased recently by the changing over of a furnace in the Derbyshire area to this grade, but overall demands are only moderate.

The orders which are being received from export merchants for shipment overseas enable the furnaces to reduce stocks, but the prospect of an increased demand from home foundries is not very bright, and forward buying is practically negligible. Most users of pig-iron are content to order supplies as they need them, and to economize in the provision of stocks as, for most grades, prompt deliveries can be obtained.

Most of the foundries have adequate supplies of scrap, the chief demand being for the better and heavier grades of cast-iron and machinery scrap. Foundry coke is coming forward in sufficient quantities to meet consumption and stock requirements, although most of the Welsh grades continue scarce. Ganister, limestone, and firebricks can readily be obtained.

The re-rollers maintain a fair rate of output, and for some of their products there is a good demand, particularly for reinforcing rods and sheets. Re-rollers of small bars and light sections, particularly those in the English Midlands, have capacity to spare and could undertake much larger tonnages. This continues to reduce their usage of small billets, and with the tonnages in stock, including both home and imported supplies, they have sufficient quantities available.

Home steelworks are able to provide increased deliveries, but present demands are not absorbing these tonnages, and with adequate supplies of prime material available there is little call for the defectives and crops which arise. Appreciable tonnages of imported steel semis have been supplied to the re-rollers in past months, but it is understood that as far as is possible these deliveries will now be curtailed.

Non-ferrous Metals

Notwithstanding the ½-cent decline in the custom smelter copper price to 25½ cents a pound last week, buying interest has been slow on both sides of the Atlantic. Indeed, even the lowering of the US and Canadian money rates had no sustained favourable impact on Wall Street and, with depressing results announced from the Rhodesian Copperbelt companies and from the big US producers, the London price has gone easier. Moreover, the announcement that the output of refined copper in October was the third highest in any month since the war—in spite of contractions in output by leading producers and three of the largest mines being closed for overhaul or affected by strikes during the month—contributed materially to the bearish sentiment. The hub of the matter seems to be that the production is still well in excess of production and that further measures necessary to bring about a production/consumption equilibrium are difficult to initiate. On the other hand, producers in the US are selling a moderate volume of the metal and one leading producer has gone on record as saying that he believes that copper consumption this year would reach peak levels. Be that as it may, the copper markets on both sides of the Atlantic are weak, and there is nothing on the horizon to suggest that a marked upward swing in the copper quotation is in the offing.

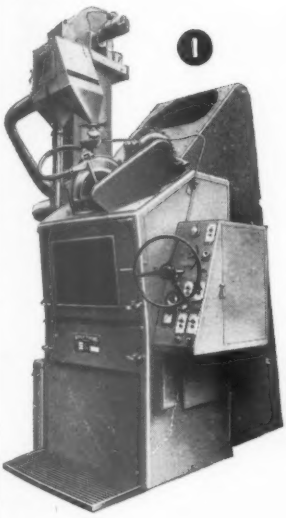
Tin is quiet in London and in New York. The centre of interest focuses around the news that there will be a special meeting of the International Tin Council towards the middle of December, at which it may discuss the desirability of imposing export quotas so soon as the buffer stock has purchased 10,000 tons of tin. Also likely to be on the agenda is the possibility of notice being given to producers for a second instalment of tin or cash.

Lead is quiet, although buying is steady. Statistics released in the US show that despite consumption in August being the highest this year, supplies were still in excess of production. It is thought in some quarters in the US that increased expenditure for missiles would help lead sales in the coming months.

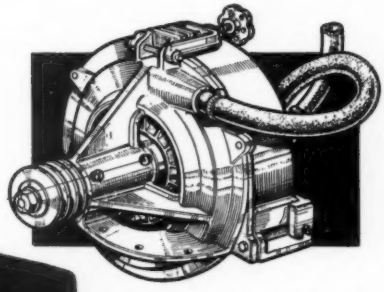
Zinc consumption remains at reasonable levels on both sides of the Atlantic, with special attention being paid to high-grade metal for the automobile industries. It is thought that the present low price of both lead and zinc are sufficiently attractive to induce the building up of stocks.

At the annual general meeting of the Southern section of the Institute of Vitreous Enamellers, held last month at the Howard Hotel, Norfolk Street, London, W.C.2, the following officers were elected:—Dr. B. K. Nicklewski, chairman; Mr. L. Turner, honorary secretary, and Mr. J. J. Guy, deputy chairman; also elected to the committee were Mr. J. H. Gray, Mr. J. Hooper, Mr. C. M. Houlton, and Mr. B. B. Kent.

Shot Blast Equipment

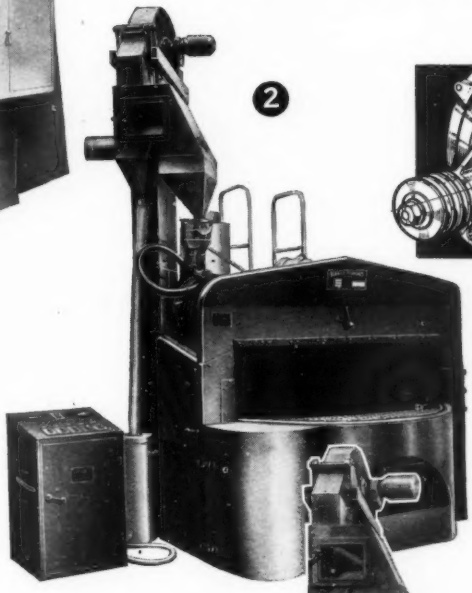


This A-S-L Turbine is the most modern Shot Blasting Unit available. The bi-phase air injection system enables shot to be projected at greater speeds using lower power with fewer replacements. The economies effected in spare parts alone are very substantial.



Baker Perkins High Speed Bi-Phase A-S-L Turbine, British Patent, No. 510681.

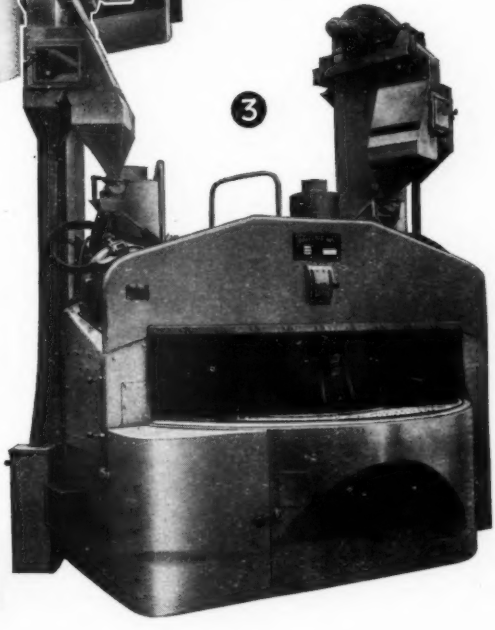
These machines do not require pits or special foundations.



1 ROTARY BARREL

2 CADET

3 MEDIUM



Our standard range of Rotating Barrel and Table Shot Blast Machines is capable of handling a wide range of Foundry products. Both types are semi-automatic, the rotating barrels being equipped with skip hoist loading gear and frontal discharge mechanism. These modern highly efficient machines are in use in Foundries all over the world, and are built to the high standards of design, materials and workmanship characteristic of all Baker Perkins' machines.

BAKER PERKINS LIMITED
ENGINEERS
WESTWOOD WORKS · PETERBOROUGH

Current Prices of Iron, Steel, and Non-ferrous Metals

(Delivered unless otherwise stated)

November 20, 1957

PIG-IRON

Foundry Iron.—No. 3 IRON, CLASS 2:—Middlesbrough, £21 6s. 0d.; Birmingham, £20 18s. 3d.

Low-phosphorus Iron.—Over 0.10 to 0.75 per cent. P, £23 17s. 0d., delivered Birmingham. Staffordshire blast-furnace low-phosphorus foundry iron (0.10 to 0.50 per cent. P, up to 3 per cent. Si), d/d within 60 miles of Stafford, £24 1s. 3d.

Scotch Iron.—No. 3 foundry, £25 3s. 6d., d/d Grangemouth.

Cylinder and Refined Irons.—North Zone, £25 19s. 0d.; South Zone, £26 1s. 6d.

Refined Malleable.—P, 0.10 per cent. max.—North Zone, £27 6s. 6d.; South Zone, £27 9s. 0d.

Hematite.—Si up to 2 per cent., S. & P. over 0.03 to 0.05 per cent.:—N.-E. of England (local iron), £25 6s. 6d.; Scotland (Scotch iron), Zone S. 1, £25 13s. 0d.; Sheffield, £26 15s. 0d.; Birmingham, £27 4s. 0d.; Wales (Welsh iron), £25 6s. 6d.

Basic Pig-iron.—£20 3s. 0d., delivered Staffs, Derbyshire, Notts, Lincs, Rutland, Northants, and Leics.

FERRO-ALLOYS

(Per ton unless otherwise stated, delivered)

Ferro-silicon (6-ton lots and over).—45 per cent. Si, £50 0s. 0d. to £52 15s. 0d., scale 17s. 0d. to 17s. 6d. per unit; 75 per cent. Si, £70 0s. 0d. to £76 7s. 6d., scale 17s. 0d. to 17s. 6d. per unit.

Ferro-vanadium.—50/60 per cent., 28s. 6d. per lb. of V.

Ferro-molybdenum.—65/70 per cent., carbon-free, 12s. 6d. per lb. of Mo.

Ferro-titanium.—20/25 per cent., 2-3 per cent. Cu, £250 0s. 0d.; 38/40 per cent., commercially carbon-free, £299 0s. 0d.

Ferro-tungsten.—80/85 per cent., 9s. 2d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 12s. 2d. per lb. of W.

Ferro-chrome (6-ton lots and over).—4/6 per cent. C, £96 0s. 0d. to £99 10s. 0d., basis 60 per cent. Cr, scale 33s. 0d. per unit; over 6 per cent. C, £94 0s. 0d., basis 60 per cent. Cr, scale 31s. 0d. to 33s. 0d. per unit; 2 per cent. C,* 2s. 2d. per lb. Cr.; 1 per cent. C,* 2s. 2½d. per lb. Cr; 0.15 per cent. C,* 2s. 3d. to 2s. 3½d. per lb. Cr; 0.10 per cent. C,* 2s. 3½d. to 2s. 3¾d. per lb. Cr; 0.06 per cent. C,* 2s. 3¾d. to 2s 4d. per lb. Cr.

Metallic Chromium.—98/99 per cent., 7s. 3d. to 7s. 10½d. per lb.

Metallic Manganese.—90/92 per cent., carbon-free, £290 0s. 0d.; 96/98 per cent., £310 0s. 0d.

Ferro-columbium.—65/75 per cent., Nb + Ta, 22s. 0d. to 23s. 0d. per lb., Nb + Ta.

Ferro-manganese (home).—78 per cent., £87 19s. 3d.

SEMI-FINISHED STEEL

Re-rolling Billets, Blooms, and Slabs.—BASIC: Soft, u.t., £33 1s. 6d.; tested, 0.08 to 0.23 per cent. C, £34 1s. 6d.; hard (0.41 to 0.60 per cent. C), £35 3s. 0d.; silico-manganese, £44 2s. 6d.; free-cutting, £37 5s. 6d. SIEMENS MARTIN ACID: Up to 0.25 per cent. C, £41 7s. 0d.; silico-manganese, £44 10s. 0d.

Billets, Blooms, and Slabs for Forging and Stamping.—Basic, soft, up to 0.33 per cent. C, £38 16s. 0d.; basic, hard, over 0.41 up to 0.60 per cent. C, £39 18s. 6d.; acid, up to 0.25 per cent. C, £43 10s. 0d.

FINISHED STEEL

Heavy Plates and Sections.—Ship plates (N.-E. Coast), £42 12s. 0d.; boiler plates (N.-E. Coast), £45 2s. 0d.; floor plates (N.-E. Coast), £44 1s. 0d.; angles, N.-E. Coast, £40 6s. 6d.; joists, N.-E. Coast, £40 2s. 6d.

Small Bars, Sheets, etc.—Rounds and squares, under 3 in., and flats, 5 in. wide and under, untested soft basic, 50 tons and over, £40 8s. 0d. (under 10 tons to 4 tons, £41 5s. 6d.; under 4 tons to 2 tons, £41 10s. 6d.); hoop and strip, coils, £40 10s. 0d.; uncoated strip mill coils, hot rolled, under 3mm. to 12g., £45 16s. 0d.; black sheets (hand mill), 24 g., 59 4s. 6d.; galvanized corrugated sheets, 24 g., £68 0s. 0d.

Alloy Steel Bars.—1 in. dia. and up: Nickel, £69 9s. 6d., nickel-chrome, £100 12s. 6d.; nickel-chrome-molybdenum, £112 16s. 6d.

NON-FERROUS METALS

Copper.—Cash, £184 10s. 0d. to £185 0s. 0d.; three months, £188 15s. 0d. to £189 0s. 0d.; settlement, £185 0s. 0d.

Copper Tubes, etc.—Solid-drawn tubes, 1s. 10½d. per lb.; rods, 215s. 9d. per cwt. basis; 20 s.w.g., 249s. 0d. per cwt.

Tin.—Cash, £730 0s. 0d. to £730 10s. 0d.; three months, £709 10s. 0d. to £710 0s. 0d.; settlement, £730 10s. 0d.

Lead (Refined Pig).—Second half November, £82 0s. 0d. to £82 5s. 0d.; second half February, £82 5s. 0d. to £82 10s. 0d.

Zinc.—Second half November, £67 0s. 0d. to £67 5s. 0d. second half February, £66 5s. 0d. to £66 10s. 0d.

Zinc Sheets, etc.—Sheets, 15g. and thicker, all English destinations £102 0s. 0d.; rolled zinc (boiler plates), all English destinations, £99 15s. 0d.; zinc oxide (Red Seal), d/d buyers' premises, £88 10s. 0d.

Brass Tubes, etc.—Solid-drawn tubes, 1s. 6½d. per lb.; sheets to 10 w.g., 164s. 3d. per cwt.; wire, 2s. 4d.; rolled metal, 164s. 3d. per cwt.

Brass (Brazing).—BS1400, B3 (65/35), £140; B6 (85/15), — ; BS249, —.

Brass (High Tensile).—BS1400, HTB1 (30 tons), £182; HTB2 (38 tons), £190; HTB3 (48 tons), £200.

Gunmetal.—BS1400, LG2 (85/5/5/5), £171; LG3 (86/7/5/2), £181; G1 (88/10/2/½), £242; (88/10/2/1), £224.

Phosphor Bronze.—BS1400, PB1 (AID released), £254 per ton.

Phosphor Bronze Strip, etc.—Strip, 242s. 9d. per cwt.; sheets to 10 w.g., — per cwt.; wire, 3s. 7½d. per lb.; rods, 2s. 10¾d.; tubes, 2s. 10½d.; chill cast bars: solids 2s. 10½d., cored 2s. 11½d. (CHARLES CLIFFORD, LIMITED.)

Nickel Silver, etc.—Rolled metal, 3 in. to 9 in. wide × 0.056, 3s. 6d. per lb.; round wire, 10g. in coils (10 per cent.), 3s. 10¾d.; special quality turning rod, 10 per cent., ½ in. dia., in straight lengths, 3s. 9¾d. All prices are net.

Other Metals.—Magnesium, ingots, 2s. 5½d. per lb. Antimony, English, 99 per cent., £190 0s. 0d. Quicksilver, ex-warehouse, £69 0s. 0d. Nickel, £600 0s. 0d. Aluminium ingots, £197 0s. 0d.; aluminium bronze (BS1400), AB1, — ; AB2, £237.

* Average 68-70 per cent.